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U. S. DEPARTMENT OF AGRICULTURE.

DIVISION OF STATISTICS.

MISCELLANEOUS SERIES. REPORT NO. 2.

REPORT

ON THE

AGRICULTURE OF SOUTH AMERICA,

WITH

MAPS AND LATEST STATISTICS OF TRADE.

PREPARED UNDER THE DIRECTION OF THE STATISTICIAN,

BY

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LETTER OF TRANSMITTAL.

U. S. Department of Agriculture,
Office of the Statistician,
February 27, 1892.

Sir: I have the honor to present for publication a series of chapters on the agriculture of South America, most of which have been presented in the monthly reports of the Statistician during the past year. Some of the more important have not before been printed. The interest in these Pan-American republics, so natural from their proximity and liberal form of government, has been intensified by the presence and deliberations at this capital of the Congress of the Americas, by the reciprocity treaties already ratified, the establishment of new lines of steamship communication, and the preparation for the coming Columbian Exposition. The desirability, if not necessity, of enlarging our markets for the surplus of farm production is another reason for cultivating this neglected commercial field, and for the publication of all available information covering the products and the market needs of these South American countries.

The matter has been prepared by Mr. Almont Barnes, of this office, whose long residence in South America as a consul of the United States at La Guayra, in Venezuela, and Curaçao, West Indies, and subsequent study of the status and progress of South American countries, has fitted him for an intelligent and comprehensive exposition of the subject.

A statistical chapter showing our trade with South American countries during the fiscal year 1890–'91, as represented by the exports of the United States and imports from those republics, is included in this publication. The aggregate of this trade is $151,963,069, made up of exports valued at $33,226,401, and imports valued at $118,736,668. It will be seen that the imports constitute 78 per cent of the whole. The agricultural imports represent a value of $100,889,912, of which 92 per cent were received absolutely without a tariff charge. The agricultural exports amount to $12,242,439. The equitable necessity for concessions in the matter of customs duties, for fairer reciprocal relations (which have already been granted largely) in view of the admission of their agricultural products practically duty free, is apparent to all.

The great disparity in amount and value of these exchanges, as shown in this bulletin, is due in part to want of direct shipping facilities, such as are enjoyed by other nations that practically monopolize the trade. While this trade has heretofore been so unequal, it has been so much a necessity as to require eight dollars in agricultural imports for every dollar of agricultural exports, under the famine of transportation facilities which has heretofore existed. Seventy per cent of this agricultural importation, or $70,675,787, came from Brazil, of which $62,022,022 was for coffee.

Respectfully,

J. R. DODGE,
Statistician.

Hon. J. M. RUSK,
Secretary.

REPORT ON THE AGRICULTURE OF SOUTH AMERICA.

INTRODUCTION.

The consideration given in the following pages to the agricultural characteristics and condition of the several countries of South America, of which comparatively little is generally known in the United States, is intended to afford information in as much detail as appears to be required in such a work, to the agriculturists of this country, concerning the character of the principal productions of the great region treated of, and of the natural conditions which determine and control such productions; and, incidentally, of the economical institutions under which the rural and other industries of the southern continent of America find play and progress.

Such information may be deemed desirable, and even necessary, in view of the awakened interest in commercial and other intercourse between the United States and the Latin-American Republics, and of the evident fact that such intercourse must, in the nature of things, greatly increase. The wonderful expansion of our own industries, and the coincident increase of the demands for natural and agricultural products not native or suited to our climate, inevitably force our attention upon portions of the world beyond us which promise the best markets for our surplus productions, and the best sources of supply of articles which we can not produce, at least sufficiently or economically. The climate of the United States being mainly a temperate one, our demand and supply relate naturally to a tropical one, especially as to agricultural articles.

The greatest extent of the United States is from east to west, and in the temperate zone. Towards the tropics the continent diminishes greatly in breadth, as do all continental bodies in their southern portions. South America has by far its greatest area in the tropics, and diminishes rapidly in its temperate zone. The climate of the United States is temperate, with very limited territorial exceptions; that of South America is tropical, exclusive of a comparatively small part of its area. Here we have continents on a north and south line, nearly equal in extent in their agricultural areas under consideration, the natural and even the artificial productions of which are in the main dissimilar. It is generally conceded that such countries, and especially so situated, are on "the natural line of trade."

But in addition to this great fact of radical difference of climate, and consequently of production, there are subsidiary geographical, topographical, and climatic facts of particular interest, which are specially favorable to an extensive interchange of commodities between the Americas. The countries are so united as to admit of international railway communication whenever it shall be demanded. The great basin of the Mississippi, the center of our largest grain-growing region and of population, lies only about 3,100 miles by sea from the great basin of the Amazon, on the equator, the distance to the mouth of the Amazon being nearly the same from New York and New Orleans; while from the latter city to the mouth of the Magdalena, in Colombia, it is at most but 1,700 miles, and from the latter by land to the heart of the Amazon basin but 1,500, or in all, from the Mississippi by water and land to the mouth of the Madeira, 3,200 miles, or about the distance from New York to San Francisco by railway.

Of further interest are the facts that in both North and South America the greatest humidity or water supply is upon the eastern side, while in South America the greatest heat is also upon the east side, but in North America upon the west. As heat and moisture are among the main causes of fertility, the singular distribution here noted having its influence upon production has also its influence upon the character and volume of exchange of surplus production. This influence on both sides of the two continents is decidedly favorable to extended and intimate relations based upon exchange of surplus products; and this is probably sure to be exhibited more and more strongly with increase of population, and of means of communication related principally to this intercontinental exchange.

It may further be noted that the extreme west coast of South America, in Peru, lies nearly as far east as the eastern coast of the United States; so that with navigation by ship canal across the narrow isthmus which connects the two continents, each is accessible to the other upon both coasts by the shortest lines of communication, and by lines shorter also than those which have been or can be established between either country and any other climatically and productively dissimilar. It therefore appears that a series of great natural causes favors an exchange of productions between the two continents, which ought to be promotive of the best and most satisfactory results to both, through the nature of the articles exchanged, and through the facility and economy of the exchange; taking into account the relative character and the growth of demand and supply, distance, time, freightage, risk, and insurance, and all the items which affect profits to the producer and cost to the consumer.

Strengthening the influence of the favorable material conditions referred to there exists, or should exist, a bond of neighborliness between the United States and the Latin-American Republics due to similarity of political institutions. It is particularly noticeable that in all the recent works upon South American States written by Europeans, the

claims of those States to a republican form of government are held up to ridicule. Yet it is as noticeable and patent a fact that nearly all the material, intellectual, and moral progress achieved in those States dates from their birth as republics. The apparent exception in the case of Brazil is technical only. The advance in that country under Dom Pedro II was mainly due to his liberal opinions, his affirmed republican tendencies.

Such are some of the general features relating to the aspect of the United States and South America towards each other as to interchange of productions. Those more particular to the several South American States are considered in the following articles. The classes of commodities of which each produces a surplus for export, and the proportion of the exportation which is made up of articles of an agricultural character, are set forth in a work entitled La America Latina, by Señor Lamas, and quoted approvingly by the Bulletin of the National Society of Agriculture of the Argentine Republic of March 20, 1891, substantially as follows:*

Argentine Republic.

	Per cent.
Wool	47
Hides and skins	24
Live stock	3
Tallow	3.2
Wheat, maize, flax	13.5
Minerals	1.5
Various	7
	99.2
Per cent agricultural	90.7

Bolivia.

	Per cent.
Silver	72
Other minerals	11
Quinia	8
Various	9
	100

Brazil.

	Per cent.
Coffee	57
Sugar	17
Rubber gum	6
Hides	5
Tobacco	4
Cotton	3
Diamonds	1
Various	10
	103
Per cent agricultural	86

Chile.

	Per cent.
Mineral products	80.12
Agricultural products	16.35
Various	3.53
	100
Per cent agricultural	16.35

Colombia.

	Per cent.
Quinia	24
Minerals	24
Coffee	21
Tobacco	10
Animal products	8
Various	13
	100
Per cent agricultural	39

Ecuador.

	Per cent.
Cacao	70
Vegetable ivory	15
Rubber gum	4
Quinia	3
Various	8
	100
Per cent agricultural	70

* In the tables presented the percentages do not in all cases aggregate 100. The discrepancies are in the document referred to.

Paraguay.

	Per cent.
Yerba maté	48
Tobacco	32
Hides	6
Oranges	3
Various	11
	100
Per cent agricultural	89

Peru.

	Per cent.
Nitrates	80
Alpaca, etc., wool	12
Cotton	4
Sugar	4
	100
Per cent agricultural	20

Uruguay.

	Per cent.
Animal products	90
Live animals	5
Agricultural products	3
Various	2
	100
Per cent agricultural, etc.	98

Venezuela.

	Per cent.
Coffee	50
Gold	17
Other minerals	6.5
Cacao	13
Various	13
	99.5
Per cent agricultural	63

As many of the countries of South America publish no statistics of their foreign trade, or publish them fragmentarily and with reference to their own varying and usually depreciated standards of value, it is always difficult to approximate satisfactorily the volume of their foreign commerce and of that of the whole combined. In the following pages great care has been taken to arrive as near the truth as possible, the results being stated in values of this country in order that they may not be misleading at sight. The statements of the imports, exports, and total trade of each country and of all South America presented in the following table are aggregated from the several tables succeeding, in articles upon those countries, and while they do not all refer to the same year they present as fair an average of value of the trade for any recent year as can be possibly arrived at. The separate articles state the sources of information from which the sums are derived, these sources being generally official and almost entirely having official sanction.

Average annual trade of South America with foreign countries, as exhibited by statistics of the last four years.

Countries.	Imports.	Exports.	Total trade.
Argentine Republic	$137,262,380	$97,006,921	$234,269,301
Bolivia	5,839,800	8,759,700	14,599,500
Brazil	89,469,452	115,367,514	204,836,966
Chile	58,761,093	60,158,346	118,919,439
Colombia	16,339,314	18,149,972	34,489,286
Ecuador	3,041,757	2,129,299	5,171,056
Guianas	8,778,081	14,250,795	23,028,876
Paraguay	2,093,000	1,204,000	3,297,000
Peru	5,442,809	5,151,554	10,594,363
Uruguay	33,498,608	30,109,327	63,607,935
Venezuela	15,792,658	19,594,893	35,387,551
Total	376,318,952	371,882,321	748,201,273

The articles herein were prepared before the value of the trade of the United States with South America and other countries for the fiscal year ending June 30, 1891, could be ascertained. From the publication of the full returns for that year, made by the Bureau of Statistics of the Treasury, the following table has been arranged relating to the trade of this country with all South America, in a manner relative to agriculture believed to be self-explaining and to cover all essential features of a general statement. By the table it appears that of the entire trade, amounting to $151,963,069 in value, 78.1 per cent, or $118,736,668, was in imports into the United States, and 21.9 per cent, or $33,226,401 in exports from the United States; and that of the imports 85.0 per cent, or $100,889,912 was in articles of agricultural derivation, while of the exports, but 36.8 per cent, or $12,242,439 was of such a character, the total value of the agricultural articles exchanged being in round numbers $113,000,000 of the $152,000,000 representing the total trade.

The table will also show that of the agricultural imports over 92 per cent were admitted free of duty. Something as near an analysis of the effects of such an extensive bequest as is possible is given in the articles upon Colombia and Venezuela; for considering the facts that generally in South America export taxes have been imposed at once upon the articles which this country has made free, and that, therefore, prices have not been reduced to consumers in this country, especially upon principal articles, the remitted import duties have become a bequest, except to the extent they are now saved through recently established reciprocities. As our agricultural exports to South America have to pay high import duties there, and as nearly all our agricultural imports from there pay an export duty, the whole subject and scope of reciprocity is of especial interest to the agriculturists of the United States.

Statement showing the imports, exports, and total trade of the United States with the several States of South America for the year ending June 30, 1891, with certain characteristics thereof relating to the exchange of agricultural commodities.

IMPORTS.

Countries.	Agricultural articles.			Nonagricultural articles.			Total articles duty free.	Total articles dutiable.	Total imports.
	Duty free.	Dutiable.	Total.	Duty free.	Dutiable.	Total.			
Argentine Republic	$4,157,880	$1,405,056	$5,562,936	$347,948	$65,660	$413,608	$4,505,828	$1,470,716	$5,976,544
Bolivia	3,734		3,734				3,734		3,734
Brazil	68,375,187	2,300,600	70,675,787	12,512,257	42,551	12,554,808	80,887,444	2,343,151	83,230,595
Chile	60,681	172,663	233,344	3,201,053	13,893	3,214,946	3,261,734	186,556	3,448,290
Colombia	3,936,981	1,395	3,938,376	810,705	16,273	826,978	4,747,686	17,668	4,765,354
Ecuador	556,880	2	556,882	279,198	357	279,555	836,078	359	836,437
British Guiana	973,877	3,892,627	4,866,504	3,782	12,920	16,702	977,659	3,905,547	4,883,206
Dutch Guiana	587,212	134,247	721,459	2,647	84	2,731	589,859	134,331	724,190
French Guiana				46,520		46,520	46,520		46,520
Peru	293,376		293,376	76,029	17,113	93,142	369,405	17,113	386,518
Uruguay	2,076,678	156,748	2,233,426	117,067	6,246	123,313	2,193,745	162,994	2,356,739
Venezuela	11,803,708	380	11,804,088	249,991	24,462	274,453	12,053,699	24,842	12,078,541
All South America	92,826,194	8,063,718	100,889,912	17,647,197	199,559	17,846,756	110,473,391	8,263,277	118,736,668

EXPORTS.

Countries.	Agricultural articles.					Total non-agricultural articles.	Total exports.	Total trade.
	Live animals.	Breadstuffs.	Provisions.	Miscellaneous.	Total agricultural articles.			
Argentine Republic	$27,950	$204	$40,206	$51,588	$119,948	$2,598,127	$2,718,075	$8,694,619
Bolivia						6,380	6,380	10,114
Brazil	4,029	4,386,121	2,146,456	122,327	6,658,933	7,390,340	14,049,273	97,279,868
Chile	1,300	117,441	77,855	72,624	269,220	2,864,771	3,133,991	6,582,281
Colombia	2,793	336,935	195,725	255,913	791,366	2,317,623	3,108,989	7,874,343
Ecuador		159,109	217,628	1,361	378,098	524,640	902,738	1,739,175
British Guiana	36,791	784,739	360,069	116,511	1,298,110	463,240	1,761,350	6,644,556
Dutch Guiana		75,928	87,311	8,215	171,454	78,250	249,704	973,894
French Guiana	284	29,066	46,517	13,790	89,657	61,053	150,710	197,230
Peru		70,106	130,211	9,819	210,136	1,186,071	1,396,207	1,782,725
Uruguay		2,368	35,782	5,661	43,811	989,126	1,032,937	3,389,676
Venezuela	25,205	1,323,773	704,057	158,671	2,211,706	2,504,341	4,716,047	16,794,588
All South America	98,352	7,285,790	4,041,817	816,480	12,242,439	20,983,962	33,226,401	151,963,069

By comparing the amount of our trade with South America with the whole amount of its foreign commerce, it may be seen that our share therein is 20.3 per cent; and that of the imports into South America this country furnishes but 8.8 per cent, while of the exports it receives 31.9 per cent. Comparing our imports with our exports the balance of trade with South America is against the United States to the extent of $85,510,267.

There is another fact of large importance relating to the present extent and character of our trade with South America, and with nearly all Latin-American countries, which can not be wisely overlooked in the present consideration, and this fact pertains to the carrying trade and its peculiar influences upon the distribution of American products.

Of our total trade with South America, amounting to about one hundred and fifty-two millions, $141,848,774, or 93.3 per cent, is with the east side of the continent, the nearest one to this country generally and to Europe. Of this trade on the Atlantic side, $114,061,689, or over 80 per cent, is in imports, of which $33,578,777 are brought under our own flag, and $80,482,912, or 70 per cent, under European flags. Of the exports to the east side, amounting to $27,787,085, not quite 51 per cent are carried under our flag, and the balance, about 49 per cent, under European flags. These disproportionate figures represent a part of the practical results of the "three-cornered" European system of sea-carrying trade which controls the distribution of North and South American products.

Thus vessels of established and usually subsidized European lines carry from European ports the productions of those countries to non-competing tropical America, their best market. From tropical America they bring to the United States the 70 per cent of our imports, referred to as carried under European flags, and representing so much of the 93.3 per cent of our whole South American trade. This importation is also non-competing, mainly, and is therefore to a best market for regular supply. These imports are then replaced by such articles of our exports as the home ports of the European vessels require, and our exports, surplus products, are carried to competing markets, where they are inevitably subjected to a more or less severe "struggle for existence."

The competition arises naturally from similarity of production incidental to similarity of climate and of economical conditions; and it is instituted for the superior benefit of the countries represented by the foreign carrying lines, through the triangular system of routes established, intentionally operating as indicated. There is no reverse system of routes by which European lines might carry our exports to South American noncompeting ports; but for such disposition of our surplus products there is the American-Brazil line to Brazil, the "Red D" line to Venezuela, the Pacific Mail Line to Central America and on the relatively unimportant Pacific coast, and there are "tramp" European

steamers and Canadian sailing vessels. The statistical statement of the facts generally, in important details, is presented in or may be deduced from the following table:

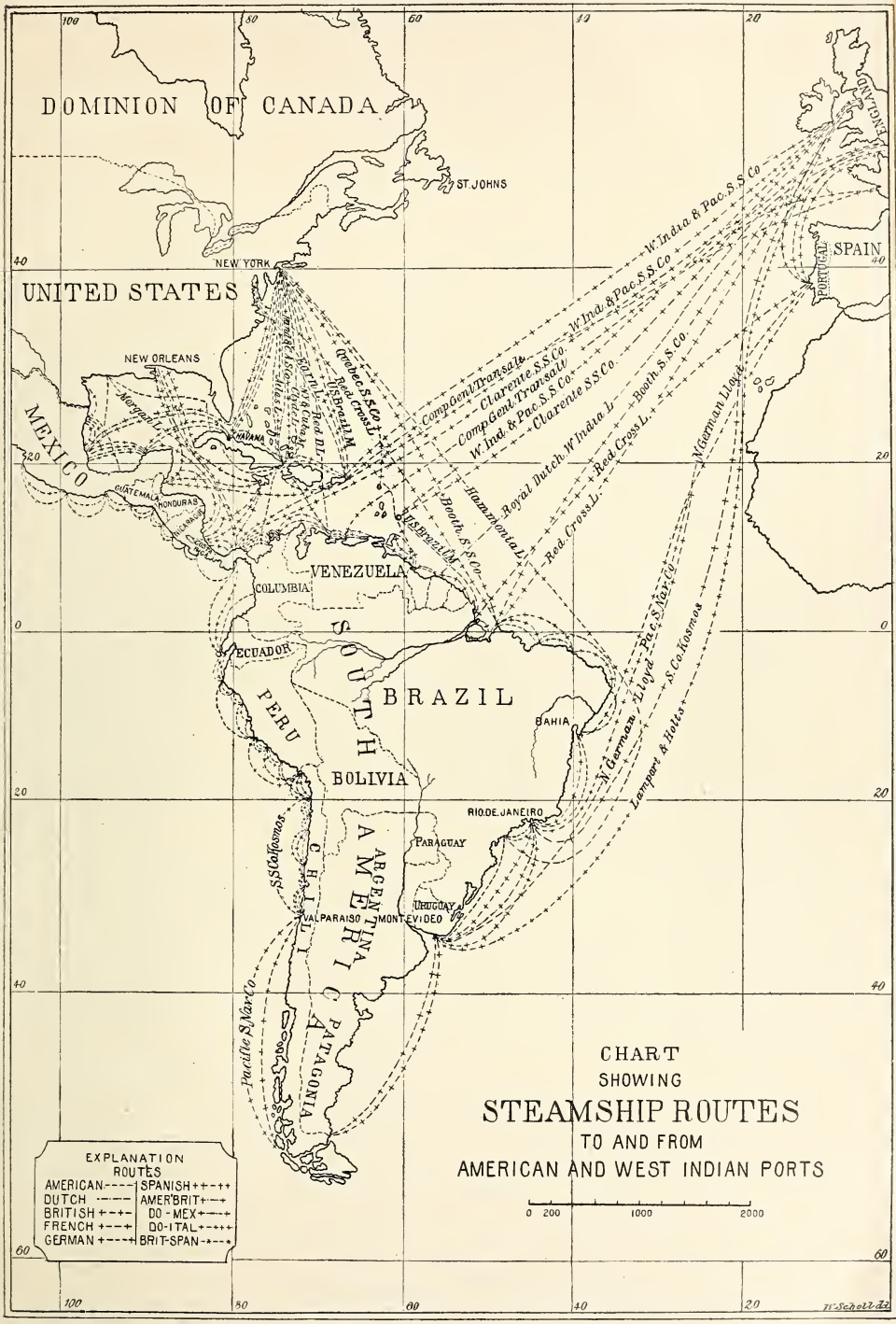
Statement showing the total and relative value of goods carried under American and foreign flags in the commerce of the United States with the several countries of South America during the fiscal year ending June 30, 1891.

From and to—	Imports in American vessels.	Imports in foreign vessels.	Per cent in American.	Exports in American vessels.	Exports in foreign vessels.	Per cent in American.
Argentine Republic	$2,269,442	$3,707,102	37.8	$619,191	$2,098,884	22.9
Bolivia	.....	3,734	.....	1,997	4,383	31.3
Brazil	16,504,314	66,726,281	19.5	6,429,006	7,620,267	45.7
Chile	1,604,872	1,843,418	46.5	1,851,782	1,282,209	59.0
Colombia	1,018,853	3,746,501	21.4	1,665,988	1,443,001	53.6
Ecuador	617,577	218,860	73.8	826,405	76,333	91.5
Guianas	2,481,944	3,171,972	43.9	1,268,691	893,073	58.7
Peru	252,833	133,625	65.4	1,062,813	333,394	76.1
Uruguay	392,646	1,964,093	16.6	162,311	870,626	15.7
Venezuela	10,911,578	1,166,963	85.3	3,962,099	753,948	84.0
Total	36,054,119	82,682,549	30.4	17,850,283	15,376,118	53.7

Relative to our total trade with South America, it appears from the foregoing statement that of the imports, amounting to $118,736,668, only a little over 30 per cent in value was brought under the American flag, and that almost 70 per cent was brought in European vessels; and that of our total exports to South America, amounting to $33,226,401, a little over 53.7 per cent was carried under our flag (represented almost entirely by two lines before named), while nearly 46.3 per cent was carried in European vessels. And the value of the whole trade being $151,963,069, the percentage of it carried under the United States flag was but 35.5, or in value $53,904,402, the superior amount of $98,058,667, or 64.5 per cent, being carried under European flags, mostly British, German, and French. In paying nearly twice over to foreign lines, mostly subsidized, what we pay to our own, in our carrying trade with South America, we place that amount of premium upon their discrimination against us in marketing our surplus products.

The accompanying map gives the names and routes of the various steamship lines between Europe and Latin America, and the United States and the same regions. It does not include the lines between Europe and the United States, however, as it was made with special reference to Latin-American trade with other countries, for the use of the Bureau of American Republics, to the courtesy of the director of which the use herein is due.

Should the proposed transfer of the Nicaragua Ship Canal to European ownership be consummated upon the completion of that interoceanic and inter-American highway, and non-American influences between the two continents and upon their uniting soil become thereby strengthened, the interflow of commerce, so interesting in all its aspects to those most naturally concerned, and facilitated by great natural con-


DOMINION OF CANADA
ST. JOHNS
NEW YORK
UNITED STATES
NEW ORLEANS
MEXICO
HAVANA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
VENEZUELA
COLUMBIA
ECUADOR
PERU
BOLIVIA
SOUTH AMERICA
BRAZIL
BAHIA
RIO DE JANEIRO
PARAGUAY
URUGUAY
MONTEVIDEO
VALPARAISO
CHILI
PATAGONIA
ENGLAND
PORTUGAL
SPAIN
W. Ind. & Pac. S.S. Co.
Compoenl Transat.
Clarence S.S. Co.
Red Cross L.
Booth S.S. Co.
Royal Dutch W. India L.
Hamburg Am. L.
N. German Lloyd
Lamport & Holts
S. Co. Kosmos
Pacific S. Nav. Co.
S.S. Colkomos
EXPLANATION
ROUTES
AMERICAN ----
DUTCH -·-·-
BRITISH +-+-
FRENCH +--+
GERMAN +---+
SPANISH +-+-+
AMER'BRIT +--+
DO-MEX +---+
DO-ITAL +--++
BRIT-SPAN -+--+
CHART
SHOWING
STEAMSHIP ROUTES
TO AND FROM
AMERICAN AND WEST INDIAN PORTS
0 200 1000 2000

ditions, as herein briefly pointed out, would be sure to encounter such obstructions as would be most for the benefit of countries bound to protect or desirous of protecting their citizen owners. Aside from this impending adversity, all present indications are apparently favorable to an increasing and more equitable commercial intercourse between the nations, whose agricultural resources are herein considered, and our own country.

Some of the more important of these progressive indications may be fitly pointed out in conjunction as having become manifest during the last fifteen years or even in the last two or three. So far as comparative statistics of progress during the longer period are concerned, they will be found in the concluding chapter.

(1) In 1877 and later several respectable trade papers, both in English and Spanish, weekly and monthly, were established in New York and other points of foreign trade in the United States, the best of which still live and prosper, and ably advocate and promote inter-American interests.

(2) In 1878 the State Department of this Government issued a circular, first prepared by the writer hereof in 1877, and later known as the "Trade Circular," which called upon our diplomatic and consular officers for all available information in the interest of export of our surplus productions, with designed reference to Latin America. Succeeding this national movement the information received has been regularly published since October, 1880, usually monthly, in the invaluable series of "Consular Reports" still issued from the Statistical Bureau of the State Department, and furnishing thousands of business men and the press with fresh and useful information not otherwise practically attainable.

(3) In and since 1881, in place of a monthly line of five sailing vessels under foreign flags mainly, there has been established a trimonthly line of new and excellent American steamships, known as the "Red D" line, between New York, Curaçao, West Indies, and the ports of Venezuela, to the great advantage of our commerce with that country and a portion of Colombia. There has quite recently also been established, with American and Brazilian capital, an American line of steamers between New York and Brazilian ports, in place of the line some years ago discontinued.

(4) The remittance of import duties, during this period, upon coffee, hides, and skins, and finally upon tropical fruits, etc., now that reciprocal arrangements in favor of our exports are in operation or are to be required, may also be considered as a very favorable and important indication of progress.

(5) And finally, not to enter into relatively unimportant matters, the welcomed visits of a national commission of this country to the several Latin American countries in 1883 and 1884, and the succeeding assembling and sessions of the first Pan-American Conference here in the

capital of the United States, with the logical results so far a matter of public knowledge, including the joint institution of a representative informative bureau here, the progressing survey of an intercontinental railway route, and the cordial coöperation secured for a Pan-American representation and industrial and historical exhibit at the approaching Columbian Exposition, have stimulated to the extent of proper elation inter-American interests of all laudable character, sufficiently to assure further and increasing harmonious development and civilized advancement to and among the Republics of the New World.

ARGENTINE REPUBLIC.

The Argentine Republic is second in extent, and, at present, the most interesting, from an agricultural point of view of the countries of South America. It has attracted the attention of the world during recent years by its progressive efforts, by the industrial successes it has attained, and recently by public misfortunes, which, it may well be hoped, are only temporarily of a serious character, acting as a check upon speculation rather than as a reversal of much of the progress attained.

GOVERNMENT AND HISTORY.

Constitutionally the Argentine Republic is more like the United States than are any other of the republics, as by the fundamental law adopted May 15, 1853, modified in 1860, it preserves a division under the general government into provinces answering to our States and having independent local governments through their chosen legislatures and provincial officers, and into territories, under the direction of national appointees. The president and vice-president are elected for a term of six years, by an electoral college chosen by the people, the former being the chief executive officer of the nation and the latter simply the presiding officer of the senate and first in succession to the chief office in case of vacancy. The legislative power is in a national congress, consisting of a senate and house of deputies, there being two senators for each of the fourteen provinces and for the federal district, elected by the legislatures for terms of nine years, and divided into three classes, as to times of succession; while members of the house of deputies are chosen directly by the people, for terms of four years, half retiring each year, and are apportioned at the rate of one for each 20,000 inhabitants. The judicial organization is also similar to that of this country, and trial by jury is guaranteed in criminal cases. Each province has its own judicial system.

The estuary of the Rio de la Plata and the region of Montevideo bordering it and opposite to that of Buenos Ayres were first discovered by

Juan Diaz de Solis in 1516, who ascended the stream with three small vessels, and upon landing was killed by the Indians. The second expedition to that region was conducted by Sebastian Cabot in 1527, but Buenos Ayres was only begun as a settlement on February 2, 1535, by Pedro de Mendoza, eight years after the beginning of the occupation of Coro, in Venezuela. The colony was unsuccessful until reëstablished by De Garay, June 11, 1580, after several other settlements had been made farther up or in the interior, as Asuncion, Mendoza, Córdoba, Santa Fé, etc. The foundation of these colonies, always cities, displaced to the necessary extent portions of indigenous wild tribes, mainly the Guaraní, Payaguá, Timbre, and Araucanian Indians.

The River Plata colonies below Asuncion were gathered under one government, at Buenos Ayres, in 1620, subject to the viceroyalty of Peru, however, and so remained until 1776, when an independent viceroyalty was established, including what now constitute the Argentine Republic, Bolivia, Paraguay, and Uruguay; but this combination fell apart when independence of Spain was declared, July 9, 1816, each of the before-named political divisions becoming finally independent governments.

However, during the viceroyalty of Buenos Ayres the Jesuit settlements along the Paraná River, called *misiones*, consisting of civilized Guaraní Indians, were independent of viceroyalties and reported only to the home government. It is historically and otherwise interesting to know, relative to these missions, that they were established by order of Philip III in 1609, to protect and civilize the Indians; that they were remarkably successful; that they extended over from 20,000 to 30,000 square miles in the Argentine Republic and Paraguay as now constituted; that they had a civilized and somewhat educated population in 1768, when they were broken up, of 138,000 people, mostly engaged in agriculture and stock-raising, living in villages, in their own neat houses, with outlying lands of their own and of their communities, with churches, schools, colleges, and industrial educational organizations; that there was sufficient community of efforts and of goods to provide for all and leave an annual surplus for foreign trade; that the people elected their own local rulers and enacted their municipal laws; and that during more than a century and a half of existence of what Bonpland, the botanist, who lived many years there, called "the Christian Republic," not a person had merited the punishment for a third offense against the laws, which was a public whipping. The productions, etc., of *misiones* are shown farther on. The Guaraní tongue, now spoken in them and throughout Paraguay, was moulded into grammatical form by the Jesuits.*

* On a recent visit to the University of Córdoba, I saw, among the books in the library, a grammar of the Guaraní language, and a heroic poem, running through many cantoes, written in hexameter verse.—Consul BAKER.

OUTLINE MAP
OF THE
ARGENTINE REPUBLIC.
BOLIVIA
BRAZIL
PACIFIC OCEAN
ATLANTIC OCEAN
REPUBLIC OF PARAGUAY
REPUBLIC OF URUGUAY
PROV. OF JUJUY
TERRITORY OF FORMOSA
TERRITORY OF CHACO
TERRITORY OF MISIONES
PROVINCE OF CATAMARCA
PROVINCE OF LA RIOJA
PROVINCE OF SAN JUAN
PROVINCE OF MENDOZA
PROVINCE OF SAN LUIS
PROVINCE OF SANTIAGO
PROVINCE OF CORDOBA
PROVINCE OF SANTE FE
PROVINCE OF CORRIENTES
PROVINCE OF ENTRE RIOS
PROVINCE OF BUENOS AYRES
TERRITORY OF LA PAMPA
TERRITORY OF NEUQUEN
TERRITORY OF RIO NEGRO
TERRITORY OF CHUBUT
TERRITORY OF SANTA CRUZ
TIERRA DEL FUEGO
FALKLAND IS.
Ft Arenas
Cobija
Copiapo
Coquimbo
Valparaiso
Santiago
Salta
Jujuy
Tucuman
Corrientes
Asuncion
Buenos Ayres
Rio de la Plata
Montevideo
Lake of Mirayres
Bay of Samborombo
C St Antonio
Bahia Blanca
Gulf of San Matias
Gulf of Nuevo
Bay of Engano
Gulf of St. George
Port Desire
Port St Julien
St of Magellan
Staten I
Bay of Nassau
Cape Horn
Is of Desolation
Gulf of Penas
Archipelago of Chonos
Valdivia
Concepcion
Talcahuano
Arauco
Angol
Mendoza
Colorado R
Negro R
Chupat R
Deseado R
Santa Cruz R
Lake Buenos Ayres
Lake Argentino
Lake Viedma
Lake Nahuelhuapi
Maipu
Hermoso
Cape Pillar
LEGEND
BOUNDARY OF THE NATIONS.
BOUNDARY OF THE STATES AND TERRITORIES.
RAILROADS IN OPERATION.
RAILROADS IN CONSTRUCTION.
CAPITALS OF THE STATES.

AREA AND POPULATION.

Occupying the southeastern portion of South America, the Argentine Republic extends from 21° to 55° south latitude and lies between 53° and 71° 17′ west longitude, and is bounded north by Bolivia, east by Paraguay, Brazil, Uraguay, and the Atlantic; south by the Atlantic, and west by Chile. Its length is about 2,351 statute miles and its average breadth a little over 475. The total area, as given in Mulhall's Handbook of the River Plate, an Argentine authority, and in recent Government publications, is 1,125,086 square miles, almost corresponding in extent with the compact area in this country included in Mississippi, Louisiana, Texas, New Mexico, Arizona, California, Nevada, Utah, Colorado, and Kansas, which united contain 1,122,685, or 2,401 square miles less. It may be further noted by way of comparison that the estimated area of the Argentine Republic is greater by 298,242 square miles than was that of the whole United States in 1789. But as the Argentine Republic now extends to the southern end of the continent, and from the Atlantic nearly to the Pacific, its progress can not be marked by any considerable expansion of territory, all boundary disputes being now settled, and Brazil being interested in the *statu quo*.

The population of the provinces was ascertained by the census of 1869 to be 1,736,922, excluding the territories. An official estimate was made in 1887, which gave the population of the whole country as shown in the following table, which also gives the names and positions of the several provinces, names of the territories and capital, and the areas of the several principal divisions, viz:

Provinces.	Area, square miles.	Population.	Provinces.	Area, square miles.	Population.
Littoral:			Jujuy	27,000	90,000
Buenos Ayres (capital,)*	.....	561,160			
Buenos Ayres (province)*	63,000	850,000	Total provinces	515,700	3,896,492
Santa Fé	18,000	240,332			
Entre Rios	45,000	300,000	Territories:		
Corrientes	54,000	290,000	Misiones	23,932	50,000
Andes:			Formosa	125,612	50,000
Rioja	31,500	100,000	Chaco		
Catamarca	31,500	130,000	Pampa	191,842	40,000
San Juan	29,700	125,000	Rio Negro		
Mendoza	54,000	160,000	Neuquen		
Central:			Chubut	268,000	30,000
Córdoba	54,000	380,000	Santa Cruz		
San Luis	18,000	100,000	Tierra del Fuego		
Santiago del Estero	31,500	160,000			
Tucuman	13,500	210,000	Grand total	1,125,086	4,066,492
Northern:					
Salta	45,000	200,000			

* From census of these for 1890.

By the foregoing it would appear that the population of the provinces averages about 7.5 to the square mile, and of the territories .2; a general average of about 3.6.

In 1869, when the last census was taken, the whole population of the Republic may be said to have been in the provinces. During the six years preceding the estimate which gives the last population statistics

there was a great augmentation, which continued until 1889, due more to organized and encouraged immigration than to all other causes, which accounts for the rapid doubling of the population. The numbers of immigrants arriving during the nine years from and including 1882 were as follows, according to official reports, viz:

Year.	Number.	Year.	Number.
1882	51,503	1888	180,993
1883	63,243	1889	289,014
1884	77,807	1890	115,168
1885	108,722		
1886	93,116	Total	1,116,408
1887	136,842		

Of the immigrants about 46 per cent are Italians, 25 per cent French, 16 per cent Spaniards, and the remaining 13 per cent are principally English, Germans, Irish, and Scotch. During the crisis in industrial and financial matters, which began to be felt heavily in 1890, 71,864 immigrants emigrated, besides those still unreported for 1891. Many went to Brazil, Paraguay, and Uruguay. Still the foreign-born element is greatly prevalent in the Republic, and will favorably influence its further though slower development when affairs reach a firmer basis, and mainly because this element consists of people, principally in colonies or operating in social union, who pursue agricultural industries of much more diversified character and with more system and perseverance than are known to natives of the same relative position and opportunities.

PHYSICAL CHARACTERISTICS.

The most detailed description of the topographical features of the Argentine Republic, and the most accurate in its details, seems to be that presented in a work of Dr. H. Burmeister, after ten years' observation. That gentleman is director of the public museum in Buenos Ayres, corresponding member of the National Academy of Sciences of the United States, and of several other scientific bodies, and his work was published both in German and French.* From the latter edition the following description is to a considerable extent drawn:

The general form of the surface of the larger part of the Republic is that of a plain, inclined from northwest to southeast. It reaches its greatest elevation among the foothills of the Andes, at from 2,000 to 4,000 feet above sea level, and thence gradually descends toward the basins of the Paraguay and Paraná Rivers, where, at latitude 22° south, its elevation is only 300 feet, further descending to sea level upon the shores of the estuary of La Plata.

* French edition, Description Physique de la Republique Argentine, 2 vols., Paris, 1876. Dr. Burmeister occupies a scientific position in South America similar to that once held by Prof. Louis Agassiz in the United States.

Along the western margin of this plain is the great mountain system of the Andes or Cordilleras, with a general direction north and south, as is that also of the two rivers named, with something of a westward trend, in their cases, which makes the plain rather broadest in its northern part, except a portion just south of the La Plata, in latitude 37° south, where the breadth is about 900 miles, or for a short distance some 200 miles greater than in the north. South of this widening the plain and continent rapidly contract, until at the eastern point of Tierra del Fuego they cease.

The topographical aspect is therefore somewhat like that of the region in the United States lying along and east of the Rocky Mountains, south of the forty-second parallel of latitude, which also decreases in altitude to the east and south, and consists mainly of grassy plains.

The Argentine plain is divided in its upper part by low mountains, in several parallel chains which follow the direction of the Cordilleras nearly, and may be considered as a prolongation of the great plateau of Bolivia, which in the form of a vast triangle extends eastward from the Andes, between 15° and 22° south latitude, and constitutes the watershed between the southwestern tributaries of the Amazon and the principal ones of the Rio de la Plata. The plain is further divided in the center by narrow, isolated chains of mountains which constitute the Sierra de Córdoba and its neighbors. The northern or smallest of these divisions is situated between the Bolivian plateau and the Córdoba chain, and is subdivided into distinct eastern and western regions. The western is distinguished by a long depression, running northeast and southwest, between the Cordilleras and the Córdoba chain. Here the plain finds its lowest depression in an ancient lake basin, now dry, 450 feet above sea level. This basin, with its salt beds, extending to the base of the mountains, and without vegetation, appears like an ancient steppe.

The southern and largest of these divisions of what may be properly called interior plain extends behind low outlying mountains down to Tierra del Fuego. So also is the depression, above characterized, extended southward to San Luis, directly west of Buenos Ayres, and united to the Patagonian steppes by a depression in the country around Lake Bevedero and its southern outlets. There is thus a considerable region lying between the Andes and the outlying plains mountains, and extending from the north well down through the south of the Republic, of present unmeasured extent, which is characterized by natural unfertility, like most of the "bad lands" of our own West.

East of the low interior mountains in the northern part of the Republic is another distinctly characterized region, of a far different aspect. It is watered or drained, as the case may be, within and on three sides, by the rivers Salado, Vermejo, Pilcomayo, and Paraná, and some of their tributaries, and includes the territories of the Chaco and Formosa, having an estimated area, as seen in the table of areas, of 125,612 square miles, or

5,000 more than New Mexico. This is characterized by Dr. Burmeister as "a vast wooded plain, with an uniform inclination from northwest to southeast, as is shown by the rivers which traverse it." Child, in his Spanish American Republics, after personal observation says more clearly:

> The Argentine Chaco, even more than the Paraguayan Chaco, appears to be still in formation; the land is hardly a few inches above low-water level and is still struggling against the river, now losing ground and now gaining; the vegetation, rank and luxurant, is thick jungle and heavy grass, which nature is growing in the hope that in the course of hundreds of years the decayed matter will form a layer of soil on the sandy basis of plain and marsh.

And perhaps this description is overdrawn, being applied to the whole region, for it is certain that there are colonies established in the Chaco region and a railroad is being extended through it. As to the principal part of the region, however, its utilization in agriculture may be expected to be quite remote.

East and southeast of the Chaco is one of the best and most easily accessible portions of the republic and one differing from all the rest in many respects. Consisting of a long, narrow strip of land nearly surrounded by the Paraná, Uruguay, and tributaries of each, it is aptly called the Argentine Mesopotamia.* It includes the provinces of Entre Rios (between the rivers) and Corrientes (the currents), and the territory Misiones (the missions), which together have an area of 122,932 square miles, or a little less than the region last described and a little more than New Mexico. The appearance of this country is similar to that in Uruguay, adjoining, except that its central elevations are less and its alluvial lands more extensive. Its northern part is also more tropical. There are no plains here, but the surface is gently undulating and covered with a green turf. In the principal depressions there are thickets and small streams, and fine forests upon the highlands and along the large water courses, especially along the Uruguay.

These general considerations include so far all the northern half of the country east of the Andes. The remainder of the eastern part is for the most part true pampa or plain land, down to and including a portion of Tierra del Fuego. The mountainous parts of Patagonia and Tierra del Fuego are abundantly supplied with timber, and in places with excellent grasses, and, like the northern portion of the country, are the sources of considerable streams.

To summarize, then, according to the nature of general physical characteristics governing in different parts, the Argentine Republic may be divided into four principal parts: (1) The Andine, consisting of the provinces of Injuy, Salto, Tucuman, Catamarca, Rioja, San Juan, and Mendoza, containing, of mountain, foothill, and both sterile and fertile pampa land, 232,200 square miles, or over 20.7 per cent. of the whole.

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* So named by M. Martin de Moussy.

(2) The Pampas, consisting of the Chaco and Formosa, the provinces of Santiago del Estero, Santa Fé, Córdoba, San Luis, Buenos Ayres, and the territory of the Pampa, containing, of comparatively level land, 501,954 square miles, or 44.6 per cent of the whole. (3) The inter-river provinces, Misiones, Corrientes, and Entre Rios, of peculiar fertility and salubrity, and resembling, in topographical features, physical character, and productions, Uruguay and southern Paraguay rather than other portions of the country of which they are parts. This region contains 122,932 square miles, orover 10.9 per cent of the whole. (4) The southern portion, extending across to the Chilean line and from the Rio Negro to Cape Horn, comprising the territories of Rio Negro, Neuquen, Chubut, Santa Cruz, and Tierra del Fuego, with characteristics of soil, climate, and production, except upon the pampas, similar to those of the opposite northern region extending from the State of Washington up through Alaska. The exception, the pampa of Patagonia, is described by Dr. Burmeister as a vast plain without grass, with a hard soil covered by low bushes, among which leguminous and woody varieties predominate, with several species of cactus. The area of this fourth division is 268,000 square miles, or 23.8 per cent of the entire country.

The several divisions of the republic answer approximately in extent to the following political divisions of the United States, viz: The first to Colorado and New Mexico combined; the second to Texas, New Mexico, and Colorado; the third to New Mexico; and the fourth to California and Oregon.

AGRICULTURAL AREA.

The most considerable area in the Argentine Republic exempt from consideration as cultivatable is that distinguished by its mountainous character, and the intimately related one lying between the Cordilleras and the lesser ranges of the interior, characterized by Dr. Burmeister as unfertile. Of course there are areas amongst the mountains which may be cultivated for local supplies to some extent, but there is comparatively little that is available as farm rather than grazing land. The length of the mountain and steppe area is the length of the country, and its average width may be estimated approximately at 100 miles, at least. This gives a total area of these parts generally unfit for cultivation, although considerable of it undoubtedly is fit for grazing, at least during portions of the year, of 235,100 square miles.

The next large area generally unsuited to cultivation is included in the southern territories below the Rio Negro generally, which together have an extent of 268,000 square miles. A small part of this has been included in the foregoing estimate, as mountain land. Considerable of it consists of the region referred to by Dr. Burmeister as Patagonia, but which now bears more modern names upon Argentine maps, and

the soil is characterized by him, as before stated, as "a vast plain, without grass, with a hard soil covered with low bushes." This description would, in a measure, describe the San Luis Valley of Colorado, of fifteen years ago, which, with irrigation, is now a productive area. Still we have Argentine authority for the assumption that the land is fit for neither cultivation nor grazing at present. It may be assumed, then, that at least half of the area of 268,000 square miles, in addition to that of the mountain lands, is unfit for cultivation. This would give an additional area of such land of 134,000 square miles.

The third considerable area unsuited to cultivation is that of the Chaco, which Child and others designate generally as naturally unsubduable or as "land in process of formation." Whatever its natural fertility or its fitness for forest growth, it is undoubtedly not generally suited to cultivation or for residence. But, making the concession that a third of it is fit for cropping, there is a remainder of 83,740 square miles which, however valuable for timber or for grazing in parts, is otherwise of no definite value.

Leaving out of the account smaller areas which are certainly unfit for cultivation, such as salt and alkaline lands, marshes, etc., or leaving them to balance any excess in estimating against the unproductive character of portions of the general mountain area, where there are doubtless valleys suitable for some kinds of crop production, the aggregate of the noncultivable areas above specified is 452,840 square miles, or a little over 40 per cent of the whole country; leaving 672,246 square miles, or nearly 60 per cent, presumably cultivable, or an area which lacks only 10,000 square miles of being as large as Mississippi, Louisiana, Texas, New Mexico, Arizona, and Colorado. Of the present uncultivable area a considerable portion is suitable for grazing, particularly in the mountain regions, and some of it may be rendered cultivable.

Of the agricultural lands now utilized, almost 37 per cent are situated in the province of Buenos Ayres, and nearly 72 per cent in the three provinces of Buenos Ayres, Córdoba, and Santa Fe, which are adjoining and are similar in character of soil and climate. The surface of this region is mostly in plains land, and altogether aggregates 135,000 square miles. The character of these cultivable and pasturable plains is partly indicated by Daireaux,* in the following statement:

> If we descend from these heights [of the inner mountains of the northwest] we enter the second region, that of the plains, that of the struggle for life, where man need demand nothing except from his own energy, and is checked by no obstacle. This land of new alluvium * * * has seemingly not yet completed its geological transformation—a post-Tertiary plain, too early occupied by man, before nature has completed its work.

The author above quoted asserts that the pampas are necessarily undergoing civilization through, first, the introduction and extension of herds which trample the soil and thus prepare the way for the culti-

* La Vie et les Moeurs a La Plata, par E. Daireaux. Paris, 1889. 2 vols. See Vol. I, p. 10.

vated or improved grasses; and second, the stocking by sheep that thrive upon the hardened and grassy soil and more evenly fertilize it for agriculture. This theory, which seems to be verified by practice, involves a sequence in which true agriculture is the relatively remote approaching period in Argentine rural development. It appears to be true that cultivation of the pampas or plains is now carried forward only in succession of a long period of herding the same regions, particularly in parts remote from the western mountains. Dr. Burmeister, in the work before referred to, states of the fertile plain region principally:

The general appearance of the pampas is that of an endless plain, destitute of trees, and covered with thin grass which grows about knee high. Viewed from a distance the surface appears to be homogeneous, but when closely examined it is seen that the herbage does not form a continuous turf, as in European fields, but is scattered in tufts, showing the bare ground between them. The grass is of very fine texture and more or less dry, and thus forms but scanty pasturage for cattle.

Before European colonization began, these plains were inhabited only by herds of deer and troops of ostriches, while the hard soil, almost without humus, and the violent hurricanes which often swept the surface, effectually prevented trees from taking root and growing there. To-day the aspect of the pampas is changed; * * * the plains are dotted with large herds of cattle and flocks of sheep, large farms and many small ones, and isolated houses are scattered all over the country. The large farms generally contain plantations of trees, introduced from Europe at great expense and with considerable difficulty. In such plantations the peach, fig, poplar, and willow are common, and the eucalyptus has been lately introduced and found to thrive well.

In the province of Buenos Ayres and the pampas of the southeast there are numerous lagoons and marshes. The lagoons are slight, bowl-like depressions, where rain water collects over an impermeable subsoil, and is there retained at the surface, forming stagnant ponds which in some cases have become more or less dry, but in others are permanent lakes. They are generally surrounded by a border of thickly growing grass, interspersed with reeds. The cienegas or marshes differ somewhat rom the lagoons. They are longer, and are covered with a thick growth of reeds, and have but little water surface. Some of these are of great extent, and are comparatively dry, with a solid surface of deep humus, upon which the pampa grass (*Gynerium argenteum*) grows luxuriantly. * * * These humid localities, however, form but a small portion of the whole area of the pampas, and hardly enter into their typical appearance, and, in fact, the northern pampas contain entire districts absolutely without water. Several of the lagoons are salt, and deposit more or less chloride of sodium, gypsum, or give rise to formations of kaolin, or contain silica in solution.

What has here been said of the pampas of the Argentine plain is applicable only to the fertile portion of the eastern and southern parts, including the province of Buenos Ayres, a part of the province of Santa Fé, and not farther into the interior than the sierra of Córdoba, to the westward of which there are no fertile plains. These conditions are repeated farther north, however, in the province of Tucuman, between the Rio Salado and the Rio Dulce. Here the plains have a richer look than in the south, owing to difference in the variety of the prevailing grasses and the thickness of the turf formed by them. * * *

The sterile pampas being in the vicinity of the mountains, or in the large valleys among them, are characterized by the presence of detritus, consisting of gravel with pebbles or rounded stones of varying size. Close about the mountains there are bowlders and blocks of broken rock, while farther off there is a layer of smaller bowlders or large rounded stones with pebbles and gravel; and as the mountains are

left behind this layer becomes thinner, the stones and pebbles smaller, and the gravel or sand finer, until upon the plains they entirely disappear and only a fine alluvial soil is found. The origin of the pampas, both sterile and fertile, is thus shown to be alluvial, and derived from the detritus of the mountain chains, this detritus having been carried farther and farther from its source by the power of water.

* * * An examination of the rivers now flowing corroborates this supposition.

The foregoing statements show with sufficient distinctness the character of the agricultural lands of the pampa regions, as to origin, natural productions, and certain features relative to humidity in the soil. Other aspects will be noticed in treating of climate and of agricultural production. Only the other considerable agricultural area embraced principally between the Uruguay and Paraná rivers remains to be considered as to character.

This "Argentine Mesopotamia" has been briefly described, as to its physical aspects and extent, under a foregoing head. Relative to its agricultural character it is, naturally and historically, one of the most interesting regions in South America if not in the New World. Its comparatively limited extent, however, which is about that of New Mexico, and the far more limited extent of its longest known portion, Misiones, which is less than that of Indiana, renders a minute and extended examination of it relatively undesirable here. The physical characteristics of the whole region are similar, except that the northern portion is most tropical, its extent being from about 25° 30′ to 34° south, or 588 statute miles. The peculiar isothermic bounds of the region, however, determine its climatic character to be that of the portion of the United States extending from southern Florida to Charleston, S. C., ranging from tropical to subtropical.

This region is everywhere covered by a layer of fertile vegetable mold, according to Burmeister and other observers, which is wanting upon the pampas. As in Uruguay and southern Paraguay, adjoining, there are shrubby thickets in many of the valleys up to moderate elevations and true forests along the eastern shores of the large streams, with grasses richer and in more abundance in the open spaces than are those of the pampas. The character of the plant life, of course, is an approach to that of the tropics, and palms, fleshy cacti, cacao, and large-leafed climbing plants abound, especially in the north. There is less of the forest aspect in the southern half, and extensive marshes cover considerable areas in Corrientes, and in Entre Rios there are annual inundations of the large rivers. Missiones is without marshes, and higher, and has more mountain and forest aspects than the other portions of the general system. It is generally better adapted to tillage than the rest, also, and for that reason, among others, was chosen centuries ago by the Jesuits as the scene of their once important operations. Of the whole region, however, Dr. Burmeister says:

The territory of the "Mesopotamia" belongs to the fertile districts of the Republic, and offers a soil very well adapted to the raising of cattle and horses. It is too wooded for sheep, and since the best pasturage is found near the hills, covered with cactus and thorn, it is impossible to grow good wool there.

Misiones, the upper part of the area in consideration and the best agriculturally, was a portion of the ancient Jesuit missions, which also included an adjacent section of Paraguay, the marvelous fertility of which is attested in the article upon the agriculture of that country which follows. These missions were established about 1608 by direct authority from the Crown, and existed under Jesuit control until 1768, when the priests were expelled. They contained then 138,000 civilized and instructed Guaraní Indians, engaged in agriculture and stock-raising, a large number of whom left the Argentine soil soon after for Paraguay. Of the aspect of their homes and country Boucher wrote in the early part of the last century, after a personal inspection:

All around me announced peace, abundance, and happiness. The well-cultivated fields showed rich crops of rice, corn, wheat, and vegetables. The larger part of the fruit trees had been introduced from Europe. In the beautiful and fertile meadows along the courses of the rivers were innumerable herds of fat cattle, and flocks of sheep and goats.

The productions of the missions during their prosperous days are enumerated as "coffee, indigo, cotton, tobacco, cacao, vanilla, wheat, corn, rice, potatoes, yams, yucca, and all kinds of vegetables, and besides the great variety of native fruits, oranges, lemons, limes, dates, figs, olives, peaches, grapes," etc. The forests yielded rubber gum, balsam, yerba maté, and honey and wax from wild bees, besides valuable timber. The botanist, Bonpland, who lived long at the missions, and was the first to describe and name as the *Euryale amazonica* what now is known as the *Victoria regia*, called the communities, which possessed a common fund, no poor, and were without a crime during one hundred and fifty years, "The Christian Republic." At least the records show the happy possibilities attending peaceful rural labors in the places those communities once occupied.

CLIMATIC CHARACTERISTICS.

The mean annual temperature of the Argentine Republic is about the same as that of the United States; that is to say, that both countries are included within the limits of similar isothermal lines, from 70 to about 40 in the latter country, exclusive of the Florida peninsula, and also from 70 to about 40 in the former. The average range of the thermometer is therefore about the same. Both are situated geographically and as to range of climate within so-called temperate zones, and other things being equal the character and range of productions of the two would be the same. In that event the two countries would be competitors to the equal extent of their surplus productions.

As in the case of other South American countries, the meteorological statistics of the Argentine Republic are few, fragmentary, and not representative of large regions. Premising that nearly the whole length of the coast of the country is swept or approached by the warm Brazilian ocean current, a branch of the great equatorial one, and that the estuary of the Rio de la Plata is constantly filled with water drawn in large

bodies from the tropics, both of which are modifying influences as to temperature and humidity, such classified and tabulated facts as are to be had and seem of value are presented in the following tables. The first tables relate to isolated stations, more or less representative of surrounding districts or provinces of the middle portion of the country relative to north and south, and of the entire breadth of that large area east of the Andes.

They are taken from Dr. Burmeister's work, wherein the temperature is given according to the Réaumur scale, and the rainfall in millimeters, and reduced for use herein to Fahrenheit standard and to inches, respectively.

Maximum and minumum temperature at Buenos Ayres and monthly averages of the same for the four years ending with August, 1873.

Months.	Maximum.					Minimum.				
	1870.	1871.	1872.	1873.	Average.	1870.	1871.	1872.	1873.	Average.
	°	°	°	°	°	°	°	°	°	°
September	81.05	71.375	74.75	74.75	75.425	39.425	38.75	34.25	38.75	37.75
October	74.75	78.8	74.75	82.625	77.675	43.25	43.25	41	46.625	43.475
November	88.25	86.9	78.8	86	85.1	44.825	43.25	42.125	43.25	43.475
December	93.65	99.95	92.75	92.3	94.775	53.375	60.125	52.25	51.125	54.275
January	93.65	96.8	97.25	90.95	93.65	52.25	53.6	51.125	57.875	53.825
February	89.375	90.05	90.05	88.25	89.375	59	58.1	53.375	54.5	56.3
March	83.75	88.25	83.75	82.625	85.55	52.025	53.825	47.3	47.75	50.225
April	73.85	80.6	78.8	77	77.675	40.55	37.625	38.75	41	39.425
May	69.8	68	63.5	70.25	68	34.25	34.25	35.375	31.325	33.8
June	65.75	70.25	70.25	69.125	68.9	30.875	33.125	34.25	32	32.675
July	64.625	66.875	65.75	73.625	67.775	32.45	29.75	29.75	34.25	31.55
August	66.65	72.5	66.875	72.5	69.575	29.75	35.375	36.5	35.375	34.25

Mean monthly, seasonal, and annual temperature at Buenos Ayres, and mean for four years ending with August, 1873.

Months and seasons.	1870.	1871.	1872.	1873.	Average monthly.
	°	°	°	°	°
September	57.425	54.058	52.025	57.200	55.175
October	58.550	60.800	59.900	65.975	61.306
November	64.625	57.425	63.725	66.875	63.275
Spring mean	60.200	57.427	58.550	63.350	59.881
December	71.375	75.425	71.600	71.825	72.556
January	73.400	74.975	74.300	76.325	74.777
February	75.425	74.525	71.375	72.275	73.400
Summer mean	73.400	74.975	72.425	73.475	73.577
March	70.475	70.025	65.500	68	68.450
April	61.025	59	63.725	60.575	61.081
May	55.850	54.275	51.800	54.275	54.050
Autumn mean	62.450	61.100	60.275	60.950	61.194
June	50	50.675	50	52.025	50.678
July	47.750	47.750	48.425	47.525	47.863
August	48.200	51.350	52.700	53.825	51.519
Winter mean	48.660	49.925	50.375	51.125	50.020
Average for the year	61.177	60.856	60.406	62.222	61.165

According to the first of the foregoing tables the maximum range of the thermometer during the six productive months of spring and summer, or from September to February, inclusive, was during the four

years from 71.375° to 99.95°, the average maximum being 86°, and the minimum range was from 34.25° to 60.125°, the average minimum being 48.183+°. According to the second table, the mean range for the same seasons was 66.729°, which is a little less than the mean of the two foregoing averages (67.09°), but still an accurate deduction from the reductions from the original tables; so that the tables substantially agree in giving the range of the thermometer at Buenos Ayres as from about 48° to 100° during the producing seasons for farm products, with an annual mean of about 67° during those months. The prevailing temperature may therefore be considered exceptionally good for crops suited to a temperate climate; and, as the range during the autumn and winter months, or from March to August inclusive, is from a minumum of 29.75° to a maximum of 75.87°, with a mean of 55.6°, the average for the year being 61.16°, the climate around Buenos Ayres and through that province may also be considered exceptionally favorable to stock and sheep raising, so far as temperature is a factor.

The record of the rainfall at Buenos Ayres for a series of years does not cover the same period as does that of temperature; but, as the aspects of the climate do not greatly vary in any large region during different series of years, this fact is not of particular importance. The following table extends, however, over twice the period of the foregoing as to length of time, and must be at least near a normal standard. The original table shows the rainfall and the mean for months and years only, but it is herein divided and summarized to show also the total for each season, as its introduction here is not solely to show climatic conditions, but to show as far as possible their influence upon agricultural production, when that subject is reached.

Monthly, seasonal, and annual rainfall, actual and mean, at Buenos Ayres, for the eight years ending with 1868, *taken by M. Eguia and approved by Dr. Burmeister.*

Month and season.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	Means.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
September	2.504	3.055	1.654	4.102	2.748	1.402	1.169	3.563	2.525
October	5.925	4.882	0.575	1.299	2.504	9.752	0.236	5.815	3.874
November	0.693	3.370	0.882	1.571	0.575	2.232	3.000	3.927	2.031
Spring	9.122	11.307	3.111	6.972	5.827	13.386	4.405	13.305	8.430
December	4.640	6.039	3.602	2.394	1.591	3.185	3.748	6.409	3.951
January	0.445	0.512	4.248	1.421	2.051	0.559	0.409	2.528	1.522
February	1.220	4.039	3.894	1.949	0.287	1.980	1.311	3.909	2.699
Summer	6.305	10.590	11.744	5.764	3.929	5.724	5.468	15.846	8.172
March	1.197	2.685	2.827	3.346	0.976	1.236	1.508	4.283	2.257
April	2.874	1.937	0.492	3.823	4.252	2.976	4.882	1.787	2.878
May	0.122	5.669	2.921	3.157	2.823	5.193	1.181	*3.009	3.009
Autumn	4.193	10.291	6.240	10.326	8.051	9.405	7.571	9.079	8.144
June	0.701	4.882	2.921	3.000	4.528	2.929	2.752	3.374	3.136
July	0.484	2.921	0.992	1.453	2.465	6.220	2.740	0.213	2.186
August	2.185	1.260	2.614	1.740	2.508	2.134	0.354	3.157	1.994
Winter	3.370	9.063	6.527	6.193	9.501	11.283	5.846	6.744	7.316
The year	22.990	41.251	27.622	29.255	27.308	39.798	23.290	44.974	32.062

*Amount not given in this single instance, and therefore the average amount is assumed for it. In reducing to inches and fractions there is a variation, inevitable except by further carrying out, of eleven-thousandths of an inch in the final figures.

Relative to the rainfall at Buenos Ayres, Dr. Burmeister states, what the foregoing table demonstrates, that it varies considerably from year to year and that "the people distinguish dry and wet years, and exact observation fully confirms this general opinion." He says further that it may be given as a rule, from popular observation unaided by science, that out of five years there are three regular years and one dry and one rainy one, and cites a table compiled by Messrs. Mossoti and Eguia as showing that of six successive years three are regular, with a rainfall of from 32 to 35 inches; two are dry, with 16 to 20 inches, and one is wet, with 51 inches. Neither annual limit of maximum or minimum is shown in the foregoing table, and the statements made above do not quite agree as to the length of the period within which great and somewhat regular variations occur, but both table and statements agree as to the fact of the variations. In analysis of the table as contained in his work, Dr. Burmeister says:

The first fact shown by this table is the inequality in the amount of rainfall for any given month. Thus January* varies between 0.40 and 4.25 inches;† February, between 0.28 and 6.91 inches, and May, between 0.12 and 5.67 inches. It may be concluded, from this great difference, that there is no certain regularity between the amounts of rainfall of any one month from one year to another, while in taking a mean for each month we get a figure that is altogether artificial, and only represents the probable quantity of rain likely to fall in the month.

But, although this mean does not indicate the monthly rainfall, it seems, nevertheless, to establish with a certain approximation the relation of one month to another. Thus January is seen to be the driest month in the year and December the most rainy. After January, which has about a third of the rainfall of December, the months of least rainfall are July, August, and November, in each of which there is about half as much as in December. February, March, and September are about equal in rainfall, as are April, May, and June, the last three having rather more rain than the first three. Finally, October is the wettest month in the year after December.

To express these facts with reference to the seasons, the springtime at Buenos Ayres is the wettest portion of the year and the winter the driest. There is much more rain there in autumn than in either winter or summer. If we take 32.18‡ inches as the mean annual rainfall, this figure may be divided among the seasons as follows: Spring, 8.54; summer, 8.16; autumn, 8.23; winter, 7.25 inches. Although these proportions are not invariable, they give an approximate idea of the rainfall in each season.§

It should be stated that according to the observations of Mossotti the annual rainfall may be as low as 16.67 inches and as high as 51.40, though these extremes were not obtained between 1861 and 1868. This observer found the same relations between the seasons as above, the greatest rainfall being in the spring and the least in the winter, while the autumn was wetter than the summer. Observations for five years showed a mean of 34.50 inches, divided as follows: Spring, 12.50; summer, 6.60; autumn, 9.80; and winter, 5.60 inches, the proportions differing somewhat from those above given and proving that the general opinion of the inhabitants of Buenos

* The original table is arranged regularly for the calendar year.

† Fractions beyond hundredths omitted or absorbed.

‡ This is 0.12 too much, by error in the March mean of the original table.

§ The fractional parts of these several sums do not agree, however, with those in Eguia's foregoing table.

Ayres as to the great differences in rainfall in various years is well founded, and that it is impossible to give a generally applicable law for the rainfall.

The same fluctuation is observable if we consider the amount of rainfall in each month. There are in the foregoing table some months with hardly any rainfall, in some years, which have very great rainfall in other years; one of the most striking differences in this respect being in the case of February, which in 1865 had only 7.3 millimeters (0.29 inch) of rainfall, while in 1868 it had 175.5 millimeters (6.91 inches.) The largest amount of rainfall in any one month in these eight years was in October, 1866, which was 247.7 millimeters (9.754 inches.) The greatest amount previously observed in Buenos Ayres was 225.2 millimeters (8.87 inches) in September, 1830.

Of the variability of the climate of Buenos Ayres the latest writer says:*

No part of the country is so subject to violent alterations of temperature or has such an uncertain rainfall as Buenos Ayres. Its climate is indeed one of the most variable in the world. In the hottest days of summer the thermometer may register in two or three hours a fall of 15° to 30° F. * * * Prolonged droughts, suddenly followed by storms of the most terrific description, make agricultural and pastoral industry in the south extremely precarious. A *seca*† lasts for months at a stretch, during which time the blazing sun—from which, for hundreds of leagues in the *camp*,‡ there is no shelter—burns up every vestige of verdure; the ground is parched and cracks up into great fissures; cattle, sheep, and horses perish by hundreds, as much from starvation as from want of water. * * * Long droughts are followed by violent storms and heavy rainfalls of uncertain duration, but sometimes lasting for many weeks. The rivers of the south * * * overflow their banks, and in an incredibly short space of time what was a burning desert becomes an angry sea.

Relative humidity at Buenos Ayres.

Months and seasons.	1870.	1873.	1876.	Average.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
September	67.0	74.3	81.8	74.4
October	69.5	69.0	74.9	71.1
November	59.6	69.5	79.1	69.4
Spring	65.4	70.9	78.6	71.6
December	58.8	63.5	81.7	68.0
January	61.1	71.9	77.0	70.0
February	65.6	73.5	77.7	72.3
Summer	61.8	69.6	78.8	70.1
March	72.6	69.3	78.8	73.6
April	73.7	71.3	84.0	76.3
May	81.6	69.5	83.6	78.2
Autumn	76.0	70.0	82.1	76.0
June	82.6	80.6	86.7	83.3
July	79.5	77.4	86.6	81.2
August	68.9	74.5	82.3	75.2
Winter	77.0	77.5	85.2	79.9
Yearly average	70.0	72.0	81.2	74.4
Average of spring and summer	63.6	70.3	78.7	70.9

* In Argentina and the Argentines, by Thomas A. Turner. New York and London, 1892.

† Dry season.

‡ Country.

Of the humidity of the Buenos Ayres region, Dr. Burmeister observes as follows:

Buenos Ayres is known as a rather humid locality, especially in winter and spring (June to November, inclusive), while the summer and autumn are dry and dusty.

He also states that the differences are considerable from year to year and for the same months in different years. Darwin and others note an increase of humidity northward from Buenos Ayres up the rivers. Relative to the humidity of the great grain-producing regions of the United States, that of Buenos Ayres does not appear excessive, and relative to that of Rio Grande do Sul, the only real wheat province of Brazil, it is at a considerable discount.

Résumé of the weather at Bahia Blanca, province of Buenos Ayres, for the eight years ending with 1867.

Season.	Mean temperature.	Amount of rainfall.	Days.		
			Rainy.	Clear.	Cloudy.
	°F.	*Inches.*			
Spring	60.1	4.67	11	60	19
Summer	75.2	4.79	10	65	17
Autumn	61.2	4.50	10	56	25
Winter	48.4	1.32	5	68	19
Year	61.2	15.28	36	249	80

Mean, monthly, seasonal, and annual temperature and humidity of the atmosphere at Córdoba.

Month and season.	Mean monthly temperature.	Relative humidity.	Month and season.	Mean monthly temperature.	Relative humidity.
	°F.	*Per cent.*		°	*Per cent.*
September	60.6	64.1	March	65.1	86.1
October	64.9	63.1	April	57.9	73.3
November	68.5	74.9	May	56.1	74.3
Spring	64.7	67.4	Autumn	59.7	77.9
December	73.4	66.6	June	51.8	82.5
January	73.0	74.4	July	46.6	68.1
February	71.8	86.0	August	53.2	71.3
Summer	72.7	75.7	Winter	50.5	74.0

Mean annual temperature, 61.9°. Mean annual humidity, 73.7.

Maximum, minimum, and mean monthly, seasonal, and annual temperature at Paraná.

Month and season.	Maximum.	Minimum.	Mean.	Month and season.	Maximum.	Minimum.	Mean.
	°F.	°F.	°F.		°F.	°F.	°F.
September	87.8	47.8	64.4	March	95.0	56.8	76.8
October	88.3	47.8	66.9	April	90.5	45.5	69.1
November	92.8	50.0	70.9	May	82.6	43.3	58.6
Spring	.....	.....	67.4	Autumn	.....	.....	68.2
December	96.1	56.8	76.6	June	77.0	28.6	54.5
January	97.5	59.0	79.7	July	69.6	34.3	46.5
February	95.7	61.2	79.3	August	77.0	43.0	59.4
Summer	.....	.....	78.5	Winter	.....	.....	54.7

Average for the year, 67.2°.

Number of rainy days and total number of hours and of amount of rainfall in each month and for the year 1875, *at Paraná.*

Month.	Days.	Hours.	Inches.	Month.	Days.	Hours.	Inches.
September	5	15	3.00	April	3	6	1.06
October	8	28	5.60	May	3	14	2.42
November	10	48	8.00	June	1	2	0.17
December	5	8	1.17	July	2	4	0.50
January	4	11	2.08	August	2	4	0.50
February	8	38	8.06				
March	2	4	0.75	Total	53	182	32.71

Besides the foregoing tables others less perfect might be given; but they relate to portions of the country not of present or prospective importance agriculturally, and their meteorology is sufficiently shown in the following synopsis of observations. In the original table a series of full degrees of the Réaumur thermometric scale is assumed as isothermis (under R. in the following), and the annual rainfall is also referred to arbitrary standards of millimeters, herein reduced to inches.

Synoptical statement of the principal phenomena of Argentine meteorology, as observed by Dr. Burmeister.

Isotherms.

Year.			Summer.			Winter.		
Standard.		Place.	Standard.		Place.	Standard.		Place.
R. °	F. °		R. °	F. °		R. °	F. °	
17	70.25		22	81.5	Pilciao 82.6°	10	54.5	Paraná 54.7°.
16	68	Tucuman 68.5°. Pilciao 68.7°	21	79.25	Tucuman 81.3°	9	52.25	Tucuman 53.4°. Pilciao 54.3°.
15	65.75	Paraná 67°	20	77	Paraná 78.6°	8	50	Córdoba 50.5°.
14	63.50		19	74.75	Mendoza	7	47.75	Buenos Ayres 49.8°. Bahia Blanca 48.4°.
13	61.25	Córdoba 61.9°. Buenos Ayres 61.7°. Mendoza 61.5°	18	72.5	Bahia Blanca 74.3°. Buenos Ayres 73.6°. Córdoba 72.7°	6	45.5	Mendoza 47.1°.
12	59	Bahia Blanca 60.8°						

Annual rainfall.		Barometric pressure.		Elevation above the sea.
Inches.	Place.	Inches.	Place.	Feet.
38	Tucuman	27.03	Pilciao	3,225
35	Buenos Ayres 35.5°	27.56	Mendoza	2,533
33	Paraná	28.55	Tucuman	1,486
32	Córdoba	28.48	Córdoba	1,368
18	Bahia Blanca 18.3°	29.78	Paraná	230
9	Pilciao 8.75°	30.03	Buenos Ayres	66
8	Mendoza	29.89	Bahia Blanca	33

A comparison of the climatic phenomena of the seven stations noted in the foregoing summary shows the greatest differences to be between the eastern and western sides of the country. The climate upon the coast, Burmeister observes, is "characterized by a general moderateness of temperature and abundant rainfall; but localities differ in this re-

spect" from north to south, and according to elevation above the sea. He says:

Buenos Ayres is less hot than Paraná, and the latter less than Tucuman, but Córdoba is cooler than either of the last two owing to its elevation, although it lies at about the same degree as Paraná. * * * The moist currents, condensed by the polar winds from the south and southwest, give an annual rainfall of from 26.8 to 32.3 inches. As to the difference between the cold and hot seasons, it does not exceed 27° F., while the annual means vary by 29° in the southern part of the country to 36° in the western part, and the extremes are exactly equal. The climate of the western side, or the Andean, is a continental one par excellence, and very dry, with winters a little colder and summers slightly warmer, though showing the same general differences in temperature from south to north as the eastern side.

This author further states in substance that the whole northern half of the country about the Cordilleras is poor in rainfall, on the east as well as on the west; and finally that south of 39° 40′ south latitude there is a third or different climate still, "which we may call the Patagonian," having a generally diminished temperature at all seasons, growing lower towards the south, the eastern half being less rainy than the seaboard northward, or than the province of Buenos Ayres, and less so than the western half also. He further states more explicitly as follows:

The steppes of Patagonia do not form a single plain like the southern pampas of Buenos Ayres, but are composed of a succession of terraces furrowed by deep valleys. They commence to the south of Bahia Blanca and extend as far as the Straits of Magellan. * * * There is hardly any water upon the terraces; there is but little rainfall, and the hard soil does not absorb the water, which thus left at the surface is soon evaporated by the high southerly winds which prevail there. Only in the valleys does water collect and allow turf to grow.

In confirmation of this there can be no better evidence than that of Darwin, who says: *

In calling up images of the past I find that the plains of Patagonia frequently cross before my eyes; yet these plains are pronounced by all wretched and useless. They can be described only by negative characters; without habitations, without water, without trees, without mountains, they support merely a few dwarf plants.

In a consideration of the Argentine climate the locally well-known pampero, a wind from the southeast, the Antarctic region, should be noticed. Mr. Turner, in his book before quoted, states that these winds usually precede the long storms which follow excessive droughts, and with sudden lowering of the temperature even to "shivering delicate glass, contracting and cracking unseasoned timber and furniture," they bring immediately severe electrical disturbances, and rain in sheets, "mingled with hailstones big as nuts." They clear and purify the atmosphere, but usually cause much destruction of property on land and sea. They appear to be periodical hurricanes, somewhat like the violent windstorms of our own northwest in their character and duration.

* Naturalist's Voyage Round the World, by Charles Darwin, p. 503, N. Y. edition of 1871.

FARM AND RANGE PRODUCTION.

Of the presumably cultivable lands in the republic, hereinbefore estimated as nearly 60 per cent of the whole area, or 672,246 square miles,* in 1888 there were only 9,123 square miles, *i. e.*, 5,838,960† acres actually in crops of various kinds, according to Government returns for that year. This area is less than 1.3 per cent of the whole agricultural area, and but little greater in extent than the State of New Hampshire. The nature and acreage of the several crops are shown by province, territory, and in aggregate in the following tabular statement, arranged from the Argentine official estimates:

Land under cultivation in the Argentine Republic in 1888, *with acreage of crops.*

	Maize.	Wheat.	Alfalfa.	Oats.	Flax.	Vines.	Cane.	Other.	Total.
PROVINCES.									
Buenos Ayres	1,188,986	557,211	204,868	43,564	98,922	7,163	.....	45,765	2,146,479
Catamarca	8,053	3,296	24,767	.....	.....	4,581	.....	70,470	111,167
Córdoba	195,207	137,825	191,712	18,940	.....	1,206	.....	34,300	579,190
Corrientes	66,210	618	3,917	314	5	516	4,986	38,659	115,225
Entre Rios	116,651	166,345	15,585	5,540	10,277	1,742	.....	20,289	336,429
Jujuy	20,371	10,116	7,173	1,233	.....	25	1,888	6,128	46,934
La Rioja	22,291	14,900	11.606	59	84	2,679	5	1,791	53,415
Mendoza	8,389	17,238	171,725	1,465	.....	16,655	.....	3,435	218,907
Salta	34,199	16,902	35,093	4,317	.....	1,470	746	2,449	95,176
San Luis	22,402	8,703	14,799	1,038	.....	170	.....	1,910	49,022
San Juan	8,194	30,257	137,360	1,725	.....	17,591	.....	1,663	196,790
Santa Fé	150,486	992,482	73,268	9,966	180,405	6,338	6,612	35,728	1,455,285
Santiago	148,260	74,130	37,505	.....	.....	12,229	7,228	25,570	304,922
Tucuman	43,724	4,927	6,877	1,258	.....	133	26,178	6,706	89,803
TERRITORIES.									
Chaco	6,662	101	329	7	.....	.....	1,327	526	8,952
Formosa	573	.....	.....	.....	.....	.....	467	541	1,581
Misiones	5,696	17	22	12	.....	2	2,189	3,571	11,509
Pampa	11,441	403	2,174	242	.....	.....	.....	724	14,984
Rio Negro	808	783	512	909	.....	.....	.....	178	3,190
Total	2,058,603	2,036,254	939,292	90,589	289,693	72,500	51,626	300,403	5,838,960

The three provinces of Buenos Ayres, Córdoba, and Santa Fé contain over 70 per cent of the cultivated land, and the first named almost 37 per cent. The three lie compactly together, between 29° and 38° south latitude, on and near the sea and the Parana River, and are probably the best portion of considerable extent of any in the country for cereal cultivation. Together they contain 135,000 square miles, 15,000 less than Kansas and Missouri united.

No official statement of the yield per acre, or in the aggregate, has been made relative to any of the Argentine crops; but Mr. Alois E. Fliess, an acknowledged authority in that country upon all agricultural matters, made an estimate of production for 1889, as to maize, wheat, and flax, the only crops affording a surplus, from which some interest-

* This is meant to be, and doubtless is, a very liberal estimate on the safe and fair side.

† An increase to over 8,000,000 acres is claimed to 1890, and some decrease in 1891.

ing facts are gathered.* Mr. Fliess states the yield of maize as averaging in 1891 1,500 kilograms per hectare, which is 23.9 bushels per acre; of wheat 650 kilograms per hectare, or 9.67 bushels per acre; and of flaxseed 500 kilograms, or 7.97 bushels per acre; this being the only statement available of the rate of yield. Applying these figures respectively to the acreage of maize, wheat, and flax shown in the foregoing table the following results are obtained as to production in 1888, by provinces, and for the whole country, viz:

Production of maize, wheat, and flaxseed in the Argentine Republic in 1888.

	Maize.	Wheat.	Flaxseed.		Maize.	Wheat.	Flaxseed.
PROVINCES.	*Bushels.*	*Bushels.*	*Bushels.*	PROVINCES—c't'd.	*Bushels.*	*Bushels.*	*Bushels.*
Buenos Ayres	28, 416, 765	5, 888, 230	788, 408	Santiago	3, 543, 414	716, 837	.....
Catamarca	192, 467	31, 872	.....	Tucuman	1, 045, 004	47, 644	.....
Córdoba	4. 665, 447	1, 332, 768	.....				
Corrientes	1, 582, 419	5, 976	40	TERRITORIES.			
Entre Rios	2, 787, 959	1, 608, 556	81, 908				
Jujuy	486, 867	97, 822	.....	Chaco	159, 222	977	.....
La Rioja	532, 755	144, 083	669	Formosa	13, 695	.....	.....
Mendoza	200, 497	166, 691	.....	Misiones	136, 134	164	.....
Salta	817, 356	163, 442	.....	Pampa	273, 440	3, 897	.....
San Luis	535, 408	84, 158	.....	Rio Negro	19, 311	7, 572	.....
San Juan	195, 837	292, 585	.....				
Santa Fé	3, 596, 615	9, 597, 301	1, 437, 828	Total	49, 200, 612	19, 690, 575	2, 308, 853

Comparing the acreage and yield of maize and wheat with those of a comparable division of the United States, for clearness of understanding, the following object lesson is presented relative to these two crops for 1888:

Region of production.	Acreage.		Total yield.		Yield per acre.	
	Maize.	Wheat.	Maize.	Wheat.	Maize.	Wheat.
Argentine Republic	2, 058, 603	2, 036, 254	49, 200, 612	19, 690, 575	23.9	9.67
State of Pennsylvania	1, 397, 350	1, 392, 728	45, 414, 000	18, 802, 000	32.5	13.5

Consul Baker, of Buenos Ayres, reports for 1890 that in the provinces of Córdoba, Entre Rios, and Santa Fé the acreage in cultivation had increased by over 1,235,000 acres during the preceding year, while in the province of Buenos Ayres it had decreased in the same time by over 867,000 acres, owing to decrease in the farming population because of the monetary crisis and consequent discouragement.

On the 2d of October, 1889, Consul Baker reported from Buenos Ayres the scarcity of breadstuffs in the Republic, the sending of orders for wheat to New York and Russia, and the chartering of vessels to import wheat from California and Oregon. At the same time cargoes were being shipped inward from Uruguay. The Buenos Ayres Standard is quoted by Mr. Baker as saying on October 1 as follows:

While reading not very many weeks ago the English agricultural papers, we were somewhat surprised to see that the Argentine Republic was expected to fill the deficit

* See article in crop reports of this Department of April, 1890, and May, 1891, translated from Buenos Ayres Standard.

in the wheat harvest, as the crops of most countries promised poor returns. While these lines were penned in London orders had gone forth from the Plate for several wheat cargoes to meet our own local deficit; and this is all the more amusing as we are accustomed to talk of our great wheat and maize yields year in, year out. The truth is the Plate, as a rule, can rely on only one good crop every three years, and we are now witnessing the effects of a short harvest.

The article states that there was little or no stock of wheat in the hands of retailers or millers, and that loaves retailed to the population grew smaller every day. The United States consul also reported the duties, intended to be nearly prohibitive to encourage wheat culture, at 7½ mills per pound for wheat, and 2 cents per pound, nearly, for flour.*

The same consul reports, however, for the end of 1890 a very different state of affairs, for it had been a "good year." The exports of wheat up to December 3 were 12,177,570 bushels, and of maize 30,464,643 bushels, and the production was estimated at 33,600,000 bushels of the former and 43,077,000 of the latter, an increase in wheat and decrease in maize from 1888. These facts exemplify the fluctuations in the total amounts of the cereal crops for successive years, a result with which natural conditions have very much to do.

As in portions of Brazil, Venezuela, Chile, Paraguay, and Uruguay, so to a greater extent in the Argentine Republic, what may be called, more descriptively than exactly, the pastoral industry is the most prominent branch of agriculture. Cattle and horses were first introduced into the country about 1535, and on the driving out of the first settlers by the Indians the stock became wild, and, with the favorable conditions of climate and forage on the pampas, increased rapidly. Horses at least have pastured portions of the Argentine plain for four hundred years, and cattle nearly as long, while sheep were a later introduction, and until 1835 received comparatively little attention. In that and succeeding years thoroughbred animals were imported from Saxony, Spain, France, and the United States for the improvement of the greatly deteriorated Spanish stock. Successive revolutions made these attempts of little value, however, and it is only since 1855 that improvement has become general, and the Creole stock has been nearly or quite superseded. Since that time also, and principally within the last fifteen years, considerable improvement has taken place in the herds of cattle and horses, which are still, as a rule, inferior to such stock in civilized countries outside of South America.

The following table shows the estimated number of cattle, horses, and sheep owned in the Republic in 1890 with their total value, as published in the Statesman's Year Book for 1891, from Argentine official statements.

* Consular Reports, No. 113, February, 1890.

Statistics of live stock in the Argentine Republic.

[Stateman's Year Book, 1891.]

	Number of horned cattle.	Number of horses.	Number of sheep.	Total value.
PROVINCES.				
Buenos Ayres	9,602,274	1,855,426	55,397,881	$194,862,993
Catamarca	239,834	56,054	152,438	3,075,429
Córdoba	2,110,513	403,879	2,355,030	28,868,717
Corrientes	1,841,366	258,696	611,085	21,480,785
Entre Rios	4,120,068	719,510	4,901,123	54,308,444
Jujuy	89,855	22,896	617,803	2,008,422
La Rioja	160,169	24,998	57,926	1,388,563
Mendoza	180,009	44,849	122,298	2,343,329
Salta	164,944	34,174	164,414	2,169,453
San Luis	478,904	113,554	241,827	6,060,212
San Juan	54,539	25,848	72,672	846,182
Santa Fé	2,328,443	527,536	2,977,382	31,978,791
Santiago	588,396	110,368	781,951	7,939,830
Tucuman	198,835	42,939	43,390	2,396,947
TERRITORIES.				
Chaco	17,551	1,597	1,751	195,012
Formosa	14,403	691	143	149,782
Misiones	41,967	17,541	4,218	565,325
Pampa	469,987	110,104	1,670,393	8,084,291
Rio Negro	77,434	16,620	287,940	1,339,210
Totals	22,779,491	4,387,280	70,461,665	370,061,717

From the foregoing table the facts are derivable that of the total number of cattle the province of Buenos Ayres possessed 42 per cent, and with Córdoba, Entre Rios, and Santa Fé over 79.7; that of all the horses Buenos Ayres had over 42 per cent, and with the named provinces nearly 80 per cent; and that of the total of the sheep Buenos Ayres had over 78.6, and with the named provinces over 93.1 per cent. This data, with that relative to crop production, demonstrates that the rural industries of the Republic are mainly confined to the compact area on the Paraná, the La Plata, and the Atlantic, within the limits of the provinces above named, containing about 180,000 square miles, or nearly of the extent of Oregon and Idaho combined. The number of sheep in the Republic is over twenty-six millions greater than in the United States, and the number of cattle thirty, and of horses ten, millions less.

It should be noted in passing that the beef and mutton of most of the South American States, especially that exported, is of far inferior quality to that derived from most other sources. The principal reasons for this are the generally prevalent facts: first, that the stock is of naturally inferior grades; second, that the methods of handling and conveying to shipping points are greatly deleterious, stock often arriving in a condition of lameness and exhaustion; and third, that the grasses of the great feeding grounds for stock are as a rule, with modifications favorable to Uruguay, Chile, and a portion of the Argentine Republic, unfavorable to the formation of excellent beef and mutton. For instance, beef furnished from the interior plains of Venezuela to the coast cities and for export is wholly unfit for any preparation for table which does not include boiling, it being otherwise too tough to eat, and con-

sequently steaks are unknown there; and about the same may be said of the native mutton, which never produces a chop which can be masticated. Generally the fiber of South American meats is tough and juiceless, and hence the local butchers provide for no preferences, but cut their beef and mutton into chunks, with a common axe, dividing the bone impartially among their customers. In most cities a meat cleaver or a meat saw is unknown.

ARGENTINE FOREIGN TRADE.

For a country having now but little if any more than 4,000,000 inhabitants and with still comparatively little development of its resources, the Argentine Republic has extended the volume of its foreign commerce amazingly within a few years. The following tabular statement will fully demonstrate this:

Progress of Argentine foreign trade from 1870 to 1890.*

Year.	Imports.	Exports.	Total trade.
1870	$38, 464, 816	$29, 651, 585	$68, 116, 401
1887	113, 244, 801	81, 467, 056	194, 711, 857
1890	137, 262, 380	97, 006, 921	234, 269, 301

It thus appears that in twenty-one years, ending with 1890, imports increased $98,797,564, or almost 257 per cent; exports, $67,355,336, or about 227 per cent; and the whole foreign trade $166,152,900, or over 244 per cent. The most of the increase has been made during the last ten years, and is due to the wonderful stimulation of immigration and colonization, to the extensive construction of railways and other works of improvement, public and private, to the sale and stocking of lands, and consequently to the putting into activity of some hoarded and immensely more borrowed capital. This activity has, however, been stimulated and sustained until 1890 at a general loss unprecedented in the history of modern enterprises, as will more fully appear under a subsequent heading.

*Amounts for 1870 and 1887 are taken from the special report of the Bureau of Statistics of the Treasury Department upon the commerce of the Latin American countries, 1889; those for 1890 directly from the Argentine official reports, reduced to United States values.

Foreign trade of the Argentine Republic, by countries, during the year 1890, according to the fiscal report of that Government for 1891. Values reduced to United States currency.

Countries.	Imports from.	Exports to.*	Total trade.
Antilles	.....	$940,947	$940,947
Austria	.....	8,214	8,214
Belgium	$10,602,175	11,582,930	22,185,105
Bolivia	82,516	199,709	282,225
Brazil	3,237,156	8,147,073	11,384,229
Chile	49,325	2,112,338	2,161,663
France	19,180,221	25,749,402	44,929,623
Germany	11,870,920	10,965,116	22,836,036
Great Britain	55,792,932	18,623,627	74,416,559
Italy	8,359,821	3,082,984	11,442,805
Netherlands	820,367	154,632	974,999
Paraguay	1,663,708	324,786	1,988,494
Portugal	106,326	440,716	547,042
Spain	4,151,704	2,010,883	6,162,587
Sweden and Norway	168,257	59,562	227,819
United States	8,975,987	5,854,614	14,830,601
Uruguay	5,679,755	5,313,941	10,993,696
All others	6,521,210	1,435,447	7,956,657
Total	137,262,380	97,006,921	234,269,301

* Consul Baker states (Consular Reports No. 124, of January, 1891) "that the exports of 1888, reduced to gold * * * actually represent only about $80,000,000, leaving a balance against the country for that year of about $48,000,000; while the exports for 1889, reduced to gold * * * actually represent only about $75,000,000, leaving a balance against the country for 1889 of about $80,000,000." Exports were given, he states, in paper dollars, which were greatly at a discount, and imports impliedly in gold. If the exports shown in the table were stated also in paper dollars or pesos, as it appears reasonable to suppose, at the average rate for 1890 of 39.8 cents in gold, the exports would be only $38,608,755 in gold value, and the balance of trade for the year $98,653,625 against the Republic.

The specific duties collected upon this trade were in amount $13,235,867, and the ad valorem duties, at from 2 to 60 per cent, were $19,812,907, making a total of $33,048,774.

The principal articles of import, and in fact nearly all, are such as represent the enhancement of values upon crude material by the activity of the various art industries, as is the case in all South America, and consist of partly prepared food substances, wearing apparel, manufactures of all kinds, tools, furniture, railway and telegraph materials, toilet and fancy articles, chemicals and medicines, oils, coal, etc.

The principal articles of export, on the other hand, represent more primitive and less artificial industries, and consist of agricultural products, including considerable wheat in some years with none in others, cattle, sheep, hides and skins, tallow, bones, wool, and an increasing amount of forest products, including fine woods. The foregoing table shows that the principal commerce is with Great Britain, France, Germany, and Belgium, in the order named, those four countries having together 164,367,323 pesos of the total for 1890, or more than 70 per cent.

The character of the Argentine foreign trade is shown to some extent from the following statement * of principal classes of articles imported and exported in 1889, and their values. Their aggregate shows a larger

* Arranged from Statesman's Year Book, 1891, and reduced to United States currency from Argentine dollars.

trade than that of any other year, occurring as the movement did at the culmination of the nation's apparent prosperity:

Imports, 1889.	Value.	Exports, 1889.	Value.
Textiles and apparel	$31,101,392	Animal and animal products	$86,157,820
Railway materials, etc.	23,326,668	Agricultural products	16,342,802
Iron manufactures	23,861,664	Manufactures	11,528,243
Food substances	17,708,622	Forest products	765,493
Drinks	14,766,051	Mineral products	1,572,139
Wood manufactures	11,683,118	Various articles	2,150,032
Coke, coal, oils	7,328,026		
Pottery, glass, etc	6,425,593		
Chemicals, etc	4,690,309		
Various, not coin, etc	18,017,494		
Total	158,908,937	Total	118,516,529
		Total trade	277,425,466

In the foregoing statement the aggregate value of the rural products imported is $32,474,673, including wines, liquors, and beer, or a little more than 20.4 per cent, while the aggregate value of the rural products exported is $103,266,115, or over 87.1 per cent. The aggregate of the foreign commerce for this highest year was $277,425,466, or at the surprising rate, for a generally primitive people, of nearly $68 for each individual in the total population, while the rate in the United States in 1890 was about $26 per capita, or $42 less.

Comparing the amount of the trade in 1889, as shown last above, with that of 1890, as stated in the first table, it appears that the decrease in imports was $21,646,558, in exports $21,509,608, and in the total trade $43,156,166, the decrease being due to the crisis hereafter to be more particularly noticed. Relative to this decrease the Buenos Ayres Standard states what may be succinctly tabulated thus:

Decrease in importations.

	In 1889.	In 1890.
Breeding stock, from	11,640 to	2,020 head.
Wire fencing, from	39,000 to	10,100 tons.
Iron and steel bars, from	59,000 to	4,000 tons.
Plows, from	39,500 to	26,800
Sewing machines, from	22,000 to	13,000
Sugar, decrease 12 per cent, or		4,000 tons.
Wine, decrease		4,400,000 gallons.
Books, decrease 30 per cent		200 tons.

Pine lumber, decrease 50 per cent.

Decrease in exportations.

Wool, in 1889	312,000,000 to	260,000,000 pounds in 1890.
Sheepskins, in 1889	80,000,000 to	59,000,000 pounds in 1890.

There was some increase in the export of frozen mutton, maize, wheat, cowhides, tallow, and linseed.

It is interesting to note that the imports of tea in one year amounted to only $487,275, and of coffee to $887,124, while that of yerbe maté, from Brazil and Paraguay, amounted to 39,921,280 pounds, of the value of $2,179,292.

The transit trade of various adjoining countries through Argentine ports during 1890, was as follows, as officially reported:

Countries.	Imports.	Exports.	Total.
Bolivia	$794,379	$3,168	$797,547
Brazil	20,311	93,206	113,517
Paraguay	34,411	252,730	287,141
Uruguay	35,280	402,650	437,930
Other	1,128,666	1,261,293	2,389,959
Total	2,013,047	2,013,047	4,026,094

TRADE WITH THE UNITED STATES.

Of the foreign trade of the Argentine Republic, that portion pertaining also to the United States is comparatively and actually insignificant, considering the extent of the commerce of each country, and the increase, and character of Argentine imports. In the foregoing statement of its foreign commerce the Argentine official statements have been used, partly as presented by the Treasury Bureau of Statistics and partly from the official statements directly. The figures, however, do not agree with those of this Government relative to the trade between the two countries, as is shown below for the year 1890, viz:

Imports from Argentine Republic, Treasury statement	$5,401,697
Being exports to the United States, Argentine statement	*5,854,614
Difference	452,917
Exports to the Argentine Republic, Treasury statement	8,322,627
Being imports from the United States, Argentine statement	*8,975,987
Difference	653,360
Total trade, Treasury statement	13,724,324
Total trade, Argentine statement	*14,830,601
Total difference	1,106,277

While it is desirable to note this difference, it is not necessary nor is it possible to distinctly and satisfactorily account for its origin, which partly arises from the fact, however, that in South American ports imported goods are entered as from the foreign port last touched by the importing vessel, and probably a similar custom prevails relative to dutiable exports, crediting their destination to the first foreign port sailed for.

The following statements of the trade of the United States with the Argentine Republic for the years named is carefully made up from the annual reports of the Bureau of Statistics of the Treasury Department, and shows separately the character, amount and value of agricultural

* Reduced from pesos.

and related exchanges between the two countries, and the respective percentages relative to the whole value of imports and exports. It should be noted, however, that the articles classed conveniently as agricultural among the imports into this country are almost wholly such as come from the herds and flocks of the Argentine pampas, and are not related to soil cultivation; while the reverse is the case relative to the most of the articles classed as agricultural among our exports. They are evidences of intelligent personal endeavor upon homesteads, and belong distinctly to civilization, and are therefore of a relatively high class, and bring relatively high prices.

It is also noticeable that the whole amount of trade between the two countries has steadily increased during recent years, and that whereas in 1886 the balance was against the United States by $690,576, it has changed in five years to a balance in our favor of $2,920,930. Agricultural exports from this country have also increased, although they are still insignificant and likely to remain comparatively so. The most noticeable of these are lard and butter, as to value and increase.

Imports from the Argentine Republic into the United States for the years ending June, 1886, 1888, *and* 1890.

Articles.	1886.		1888.		1890.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Agricultural.						
Animals, living				$50		$29
Fertilizers		$103,244		50,762		
Goat-skins		497,570		538,178		556,688
Hair		361,086		237,303		184,916
Hides		2,249,201		3,431,025		2,884,514
Indigo.....pounds					304	219
Linseed.....bushels	239,050	265,965	83,504	87,860	28,745	31,599
Meat products		105				
Oils.....pounds			95	79		
Seeds		8,829				
Tea.....pounds			60	10		
Vegetables		29				
Wood, not manufactured		1,040				
Wool, not manufactured...lbs	12,109,844	1,183,727	11,000,584	1,178,003	13,583,448	1,400,563
Total of agricultural articles		4,670,796		5,523,270		5,058,528
Nonagricultural.						
Books				5		110
Building stone		114		9		296
Chemicals and drugs		477				
Coal.....tons	54	122	19	40	30	65
Copper, ore, and manufactures of						82
Feathers		36,318		47,122		64,033
Flax, hemp, and jute products		42		160		
Furs		96,124		239,410		95,513
Glass				15		62
Glycerine.....pounds					17,597	2,235
Iron, and manufactures of..tons	1,870	22,782	2,304	26,057	1,172	13,370
Leather		4,232				17
Metals, all other				168		10
Paints		486				
Paper stock		787		298		349
Personal effects		650		630		10
Precious stones				2,490		
Silk		83				
United States products, exported and returned		1,245		15,384		10,356
Wines and spirits		42				710

Imports from the Argentine Republic into the United States for the years ending June, 1886, 1888, and 1890—Continued.

Articles.	1886.		1888.		1890.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Nonagricultural—Continued.						
Wood, manufactured		$386				$174
Wool, manufactured		38				61
Miscellaneous		187,622		$47,101		155,716
Total of nonagricultural articles		351,550		378,889		343,169
Agricultural imports		4,670,796		5,523,270		5,058,528
Nonagricultural imports		351,550		378,889		343,169
Grand total of imports		5,022,346		5,902,159		5,401,697
Percentage agricultural		93 0		93.6		93.6

Exports from the United States to the Argentine Republic for the years ending June 30, 1886, 1888, and 1890.

Articles.	1886.		1888.		1890.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Agricultural.						
Animals, living:						
Cattle.....number			25	$12,500	34	$7,200
Hogs.....do	2	$50				
Horses.....do			10	9,100	42	50,300
Sheep.....do	14	1,300	68	5,000		
All other and fowls...do						28
Animal matter:						
Glue.....lbs	73	12				
Grease		232		23		547
Hides and skins other than fur		1,670				
Oils:						
Lard.....gallons	2,500	1,115	720	520		
Meat products:						
Beef, canned.....pounds		87	2,592	196	950	75
Beef, pickled.....do			800	36	30,100	1,223
Beef, cured.....do			418	80		
Bacon.....do					668	47
Hams.....do	1,315	154	1,950	249	871	120
Pork, pickled.....do	69,080	6,075			73,385	6,884
Lard.....do	361,815	31,956	481,506	44,420	516.682	45,908
Poultry and game		513				24
All other		674		1,719		2,246
Dairy products:						
Butter.....pounds	1,720	496	8,108	1,861	56,975	8,503
Cheese.....do	1,250	152	1,751	247	1,980	256
Milk		25		623		
Total of animals and animal matter		43,911		76,574		123,361
Bread and breadstuffs:						
Bread and biscuits.pounds	96	8	13,776	1,481	6,460	521
Cornmeal.....do			200	468		
Oats.....do			440	220		
Wheat.....bushels					76,005	71,057
Wheat flour.....barrels			150	740		
All other		2,859		3,072		823
Total of bread and breadstuffs		2,867		5,981		72,401
Cotton-seed oil.....gallons	577	179	1,184	610	33,885	17,105
Miscellaneous:						
Fruits and nuts:						
Apples, dried..pounds	50	5	1,300	134		
Apples green or ripe, barrels					3	16
Fruits, preserved		242		339		778
All other				1,498		
Hay.....tons			19	326		
Hops.....pounds			100	25		

Exports from the United States to the Argentine Republic for the years ending June 30, 1886, 1888, and 1890—Continued.

Articles.	1886.		1888.		1890.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Agricultural—Continued.						
Miscellaneous—Continued.						
Oilcake.....pounds..	303,273	$5,500	493,125	$6,035	.....	.....
Linseed oil.....gallons..	40	22	.....	.....	.....	.....
Seeds, all sorts	.....	2,062	.....	174	.....	$2,456
Tobacco, leaf and stem..pounds..	1,334,605	98,015	229,147	20,477	948,021	54,228
Vegetables:						
Peas .....bushels..	2	6	.....	.....	.....	.....
Canned vegetables.....	.....	83	.....	310	.....	945
All other, including pickles	.....	40	.....	206	.....	60
Total of miscellaneous products.....	.....	105,975	.....	29,534	.....	58,483
Animals and animal matter.....	.....	43,911	.....	76,574	.....	123,361
Bread and breadstuffs	.....	2,867	.....	5,981	.....	72,401
Cotton-seed oil.....	.....	179	.....	610	.....	17,105
Miscellaneous	.....	105,975	.....	29,534	.....	58,483
Total of agricultural exports.....	.....	152,932	.....	112,699	.....	271,350
Nonagricultural.						
Agricultural implements	.....	591,588	.....	877,519	.....	1,065,445
Books and maps	.....	67,008	.....	90,561	.....	157,819
Brass and manufactures of.....	.....	5,999	.....	6,093	.....	6,650
Carriages, cars, etc	.....	54,681	.....	489,213	.....	1,321,256
Chemicals and drugs	.....	86,567	.....	115,836	.....	122,611
Cotton and cotton goods.....	.....	494,486	.....	486,028	.....	476,079
Fish and oysters.....	.....	16,993	.....	32,651	.....	30,826
Flax, hemp, and jute.....	.....	110,575	.....	133,664	.....	316,986
Glassware	.....	21,712	.....	39,249	.....	26,494
Gunpowder and explosives	.....	5,921	.....	6,683	.....	4,396
India-rubber goods	.....	5,549	.....	7,071	.....	3,697
Instruments	.....	5,019	.....	16,271	.....	198,516
Iron and steel and manufactures of	.....	536,298	.....	740,680	.....	1,424,125
Leather, including boots and shoes	.....	15,273	.....	24,290	.....	30,899
Naval stores.....	.....	66,245	.....	43,283	.....	67,453
Paints and varnishes	.....	20,659	.....	15,998	.....	16,282
Petroleum products ...gallons..	2,505,697	278,188	3,506,952	426,654	3,461,260	441,830
Paper and stationery	.....	28,042	.....	25,576	.....	24,138
Plated ware	.....	43,925	.....	114,166	.....	72,370
Starch ..... pounds..	490,318	15,982	515,240	15,648	494,857	15,067
Sugar and molasses	.....	41,645	.....	123	.....	55
Turpentine.....gallons..	104,450	42,033	243,570	94,716	189,100	86,591
Tin, manufactures of	.....	4,600	.....	3,496	.....	4,019
Tobacco, manufactured.....	.....	33,332	.....	26,619	.....	38,524
Wood, manufactured	.....	1,332,617	.....	1,839,012	.....	1,825,029
Wool, manufactured.....	.....	3,335	.....	311	.....	242
All other articles	.....	250,566	.....	315,351	.....	273,878
Total of nonagricultural exports	.....	4,178,838	.....	5,986,712	.....	8,051,277
Total of agricultural exports ...	.....	152,932	.....	112,699	.....	271,350
Total of nonagricultural exports	.....	4,178,838	.....	5,986,712	.....	8,051,277
Grand total of exports.....	.....	4,331,770	.....	6,099,411	.....	8,322,627
Percentage agricultural	.....	3.5	.....	1.8	.....	3.3

RECAPITULATION.

	1886.	1888.	1890.
Grand total of imports	$5,022,346	$5,902,159	$5,401,697
Grand total of exports	4,331,770	6,099,411	8,322,627
Grand total of trade.....	9,354,116	12,001,570	13,724,324
Per cent of imports agricultural	93.0	93.5	93.6
Per cent of exports agricultural.....	3.5	1.8	3.3
Per cent agricultural of whole trade	48.25	47.65	4.458

The following abstract of the Argentine tariff law, so far as it relates to agricultural and kindred articles of import and export, is made from the act as published in Das Handelsmuseum of Vienna, of December 24, 1891:

ARTICLE 1. All merchandise imported from foreign countries for consumption is subject to a duty of 25 per cent ad valorem in the warehouse, except the following articles, which pay:

(1) A duty of 60 per cent: Cigars and tobacco of all kinds, chocolate, cheese, butter, canned fish, meat, and fruits of all kinds.

(6) A duty of 15 per cent: Farina, unmanufactured white pine, spruce and hemlock timber.

(8) A duty of 5 per cent: All kinds of machinery for agricultural and industrial purposes.

(10) The following articles are subject to specific duties as set forth, viz:

Articles.	Argentine standards.		United States standards.	
	Unit.	Duty.	Unit.	Duty.
		Peso.		*Dollars.*
Beer, bottled, not above	1 liter	0.15	Per bottle	0.14475
Brandy, gin, in casks	Per liter	.30	Per gallon	1.09586
Brandy, in bottles, not above	1 liter	.30	Per bottle	.2895
Cakes and pastry	Per kilogram	.15	Per pound	.06566
Candles, stearin or paraffin	do	.15	do	.06566
Cider, in bottles, not above	1 liter	.15	Per bottle	.14475
Corn, shelled	Per kilogram	.05	Per pound	.02189
Cornmeal	do	.05	do	.02189
Flour, wheat	do	.05	do	.02189
Petroleum	Per liter	.03	Per gallon	.10959
Starch	Per kilogram	.09	Per pound	.03939
Sugar, raw	do	.07	do	.03064
Sugar, refined	do	.09	do	.03939
Stearin	do	.14	do	.06128
Wine, in bottles, not above	1 liter	.25	Per bottle	.24125
Wine, in casks	Per liter	.08	Per gallon	.29223
Wine, in casks, sweet	do	.25	do	.91322
Whisky, in casks, not over 30° proof	do	.15	do	.54793

ART. 2. The following extraordinary duties are created, the revenue from which is to be used exclusively for the increase of the conversion fund:

(1) For each liter or bottle containing 1 liter or less of alcohol or alcoholic beverages named in article 1, a duty of 5 centavos ($0.1826 per gallon).

(2) Wines, in casks, of more than 18 degrees alcohol, pay 1 centavo per liter and degree ($0.00965 per degree and $0.00913 per quart).

(4) Each kilogram of cigars other than Havana, 2 pesos ($0.875 per pound).

(7) Tobacco other than Havana, leaf or cut, 1 peso per kilogram ($0.44 per pound).

(8) Cigarettes, 2 pesos per kilogram ($0.875 per pound).

ART. 3. The following home products pay an export duty of 4 per cent ad valorem: Animal oil; horns and horn tips; charqui; bone ash; bones; hides, skins, and furs; hoofs wool, raw and washed; ostrich feathers; tallow.

Articles packed in two or more wrappings, and on which duty is imposed by weight, pay the specific duty for net weight and weight of the immediate covering, except tea, which pays per net weight.

ART. 5. Under this are placed upon the free list, among other articles, cotton, raw or in thread, for weaving; horses, cattle, sheep, and swine, for breeding purposes, and heavy draft horses; curved or bent wood, weighing 2 or more kilograms per piece, and staves; denaturalized tobacco for sheep scab; fresh fruit; hops; maize in the ear; fresh fish; wood pulp for paper; agricultural seeds, including wheat, and living plants, subject to the law relative to phylloxera.

MEANS OF COMMUNICATION.

As a necessary adjunct to the sale of public lands and to the establishment of colonies of immigrants, the building of railway lines has received great attention from the Argentine Government, and development in this respect has been rapid and extensive. The character of the work, relative to economy and permanence, is in many instances the subject of unfavorable comment. In his message to Congress in December, 1889, President Celman stated that the Republic had in service 5,017 miles of railway, with 6,160 more in construction on which 310 miles of rails were laid, and 4,556 miles more were projected. Of the roads Mr. Child, who heard the message read and who traveled through the Republic in 1889 and 1890, says:

> In reality there are but two well-managed and adequate lines in the whole Republic, namely, Buenos Ayres to Rosario (548 kilometers), and the Great Southern (1328 kilometers).* The rest are, for the most part, badly built, badly managed, and insufficiently provided with rolling stock; many have been constructed without any other object than land speculations, and the government guarantee of 7 per cent interest. The amount of guaranteed interest paid by the Argentine Government in 1889 to railroad companies was more than $3,000,000. * * * The latest folly is the building of railways in the Chaco, where the land is still, so to speak, in formation, and so loose that the track has to be relaid almost after every shower of rain.

The Statesman's Year Book for 1891 gives the total length of lines in 1890 as 5,798 miles. The cost of lines open for traffic at the beginning of the year was $249,907,796. The receipts for 1889 are reported as $35,250,907, and the expenses $24,420,152. In 1890 there were 4,840 miles under construction, but some lines have been given up under pressure of the crisis of that period.

In 1890 there were 12,000 miles of Government and 7,000 miles of private telegraph lines in operation, which connected the capital, as do the railways, with almost the whole country. The length of wire was about 30,000 miles. There are nearly a thousand post and telegraph offices, sending annually over three and a half million dispatches, forty-three million letters, thirty-three million newspapers, and a million postal cards.

Besides the several railway lines there is on the water ways of the principal rivers abundant accommodation for freight and travel on the most elegant, commodious, and well-conducted lines of steamers in South America. Rates of travel and freighting are very high, however, whatever method one may choose or be compelled to employ.

As to international communication, there are many lines of steamers from European ports, with the peculiar triangular system of routes which enables vessels under foreign flags to do the carrying business of the United States in their own interest, and to serve home ports first, and to the fullest extent of demand, with South American products. The system is ample for transportation, and aids in keeping prices of exported products at the minimum, and prices of articles purchased abroad at the

* Respectively 338.53 miles and 825.22 miles.

maximum, while it also discriminates against the trade, and especially the export trade of this country. There is no line of American steamers touching south of Rio de Janeiro.

MENTAL AND RELIGIOUS INSTRUCTION.

Primary instruction in the several provinces is under the direction of their respective governments, but in the national capital and territories, under that of the general Government. The total sum contributed to the support of schools in 1889 was $9,449,115. There were over 3,000 elementary schools, with over 6,000 teachers and 259,695 pupils. The secondary schools are all under control of the general Government, there being one in each province and at the capital, with 464 professors, and about 2,600 students. There are besides, two universities, a school of mines, two colleges of agriculture, a naval and a military school, all fairly conducted and attended, and 36 normal schools with over 12,000 attendants. There are also two national observatories, outside the capital, two museums, and a bureau of meteorology. Buenos Ayres has a well-conducted press, including illustrated monthlies. The constitutional faith is that of the Roman Catholic church, which is supported by the government, and has five seminaries. A large amount of money has been devoted to the building and furnishing of school edifices in Argentine cities, especially Buenos Ayres, during recent years—one of the best investments the country has made in its prosperity.

GOVERNMENT FINANCES.

The official estimates of the revenues and expenditures of the Argentine Republic for 1889 and 1890 given in United States values, were as follows, those for 1891 being the same as for the previous year, viz:

Revenue.	1889.	1890.	Expenditures.	1889.	1890.
Import dues	$38,358,750	$45,420,000	Interior	$15,064,821	$15,659,397
Railways	115,800	.....	Finance	23,880,634	25,080,247
City taxes	3,184,500	3,811,750	Instruction	8,451,305	9,183,930
Banks	3,912,110	7,430,500	War	8,019,902	9,174,280
Stamps and post-office	5,114,500	5,838,250	Marine	2,806,907	3,888,400
Sundry	7,430,500	8,366,550	Foreign affairs	1,395,506	2,509,269
Total	58,116,160	70,867,050	Total	59,619,075	65,505,523

The official statement of the public debt, made on the 31st of March, 1890, was as follows, in United States values:

Internal 5 per cent bonds, quoted at	$1,112,835
Four-and-a-half per cent bonds, guaranteeing national-bank circulation	156,104,769
Foreign debt	$118,003,265
Floating debt, gold	4,203,391
Floating debt, paper*	596,839
Total debt	280,021,099

* On the 31st of March, 1890, the value of a paper dollar of the Republic was officially stated to be 36.6 cents, or a little over 35.3 of our money; and the debt in paper dollars was $1,690,766.

In opening Congress in May 1890, President Celman said of the financial situation:

> The financial difficulties which were beginning at the close of the last Congressional period have increased in intensity, assuming the character of a commercial and economical crisis, which has affected stocks, restricted the use of credit, made objects of consumption dear, and even awakened alarm and want of confidence.

In explanation of the causes of the crisis the president further said:

> The vertiginous rapidity of our progress, the excessive expansion of credit and its abuses, extreme speculation in *agio*,* in joint-stock companies, in the price of land, and in the creation of bogus affairs, are the causes that have determined the evil.

COLONIZATION AND AGRICULTURE.

Esperanza, in the province of Santa Fé, is the first colony established under the system of colonization, which dates back to 1856. There are now about 300 colonies in the Republic, and nearly one-fourth of the population is derived from immigration.

The immigrants are almost exclusively the agriculturists of the country. They are, as a rule, settled in communities; sometimes in new villages, with a village cottage and garden and outlying land, and sometimes upon farms of 40 acres (16 hectares) along rivers, or 124 (50 hectares) farther back. Lands are sold usually, and small cottages built and fences erected on time payments to the Government; but the settler must furnish his own means of industrial operation and of subsistence. By far the largest number of these agriculturists are Italians, with French next, although the Republic has gained sturdy laborers, these new additions to the population will continue to employ very primitive methods and implements of husbandry, and these conditions will continue for a long time and generally characterize the agriculture of the country. This may the more certainly be expected if, as is asserted confidently, the agricultural lands have now been nearly all sold. Thus it will appear that while the Republic gains very much in securing a comparatively large number of landholders and cultivators, it does not put its agriculture upon a basis to compete with the more extensive, intelligent, and scientifically conducted systems of many other countries.

Besides all this the recent crisis in monetary and industrial affairs has depopulated some of the colonies and decreased cultivated areas to a very noticeable extent; and it is doubtful if the country can soon reach again the extent of farm production of the last few years.

GENERAL CONSIDERATIONS.

"The national industry of the Argentine is cattle-breeding," is the assertion of Mr. Child. This has been the fact since the Spanish colonies became established and broadened out, until the further assertion

* Agio, or agiotaje, speculation in paper money, or on its basis; on fictitious values.

of the same author is verified, that "the Argentine Republic is now the richest country in the world in sheep, and third in rank after the United States and Russia in horned cattle and horses. This fact," he continues, "however, implies an enormous production of meat for which there is no sufficient market, and the wool and hides remain the chief elements of profit." The excess of meat production over local consumption is estimated at over 1,500,000,000 pounds, of which only about 33,000,000 pounds are exported in various forms of preservation.

But while cattle-raising is undoubtedly the national industry, the interesting question in the present connection is whether such will continue long to be the case. And this must be determined, not by any volition of the Government to substitute arable agriculture to a greater or less extent, but by natural conditions which greatly favor one line of production rather than the other, and which prevail over the greatest portion of the country. If the customs of the native inhabitants and most extensive landowners coincide with the natural conditions, the conclusions to be arrived at will be the more emphatic.

It is evident from what has preceded relative to soil and climate that while there are areas of agricultural land which are also suitable for cattle farming, it is not certain that considerable portions of the pasture lands are well suited to agriculture, the certainty, indeed, being against such an assumption as to large portions of southern Argentina. Cattle can be successfully raised in Tierra del Fuego as they are in the Falkland Islands in large numbers, while neither region has any noticeable value for other branches of husbandry.

As regards the Argentine plains or pampas, the portions of them now devoted to tillage are those which have for hundreds of years been pastured by vast herds of horses and cattle and flocks of sheep. That portion of them over which ranches have recently been extended have never known cultivation nor herding until a comparatively few years ago when they were reclaimed from the Indians. According to the best authorities, treeless plain lands which have not been herded and grazed by large animals during centuries and perhaps ages are not naturally suited to agriculture. The Argentine pampas were originally the home of no larger animals than small deer, the guanaca, and ostriches, and unlike the plains and prairies of the west of the United States they have not been worked by the hoofs and fertilized by the waste of countless herds of buffalo, elk, deer, etc., for centuries, until the compacted soil assumed continuous sod and bore abundance of nutricious and tender grasses. Relative to the difference between virgin plains and those long pastured, Darwin's observations are valuable. He says:*

> The plain here looked like that around Buenos Ayres; the turf being short and bright green with beds of clover and thistles, and with bizcacha † holes. I was very

* Voyage Around the World, p. 118.

† A burrowing animal, something like a rabbit.

much struck with the marked change in the aspect of the country after having crossed the Salado. From a coarse herbage we passed on to a carpet of fine green verdure. I at first attributed this to some change in the nature of the soil, but the inhabitants assured me that here, as well as in Banda Oriental, where there is as great a difference between the country around Montevideo and the thinly inhabited savannahs of Colonia, the whole was to be attributed to the manuring and grazing of the cattle. Exactly the same fact has been observed in the prairies of North America, where coarse grass between 5 and 6 feet high, when grazed by cattle, changes into common pasture land.

But the testimony of Dr. Burmeister goes more to the point, as to the nature of the pampas soil unfitting it for agriculture, and he is Argentine authority. In his work upon the Argentine Republic, previously cited, he says:

Cattle-raising is the principal occupation to be pursued in this country, meaning the pampas, and will be for a long time on account of the nature of the soil. The areas to be transformed by agriculture or forest planting will always be of small extent. It is an old principle, based upon experience, that cultivation upon virgin land is only productive when the anterior natural vegetation has been destroyed to give place to the new, and that this new vegetation is, and should be, inferior to that which it supplants. Thus in Brazil coffee is cultivated upon the clearings of the magnificent tropical virgin forests. But upon the Argentine pampas this is not the case. Even the fertile pampas produce only a poor surface of grass, much inferior to the wheat sown to replace it. Such attempts will never succeed. The pampas should be reserved for pasturage, and can not be successfully cultivated except in a few specially favored localities. They will never constitute fertile arable land throughout their whole extent.

These conclusions and statements of the Argentine scientist are, in part, strengthened by those of Emile Daireaux, in the second volume of his work upon the Argentine country and people, the second edition of which work was published in 1889.* Mr. Daireaux became a citizen of the country, where he resided during ten years, and as he has produced several works of high character, he may be taken as at least good authority. He says of these plains:

In general the surface is covered by a thin layer of humus which barely suffices to support an inferior herbage, insufficient for the pasturage of cattle. In lower lying lands, especially along the rivers, where there is an accumulation of alluvium and vegetable detritus, the soil is able to support a vegetation of a superior order. Such places, forming oases as it were, are utilized by colonists for the pasturage of cattle, and this very pasturage supplies what is lacking in the soil to awaken its productiveness. A similar operation took place upon the plains of North America, before the advent of men, where the buffalo increased the fertility of the soil while pasturing upon it.

Cattle-raising upon a large scale upon the pampas is not, and never has been, in the opinion of this author, a lucrative pursuit in itself, in which opinion he is not sustained apparently by others; but he considers that "it serves as a civilizing influence, increasing the value of the soil for future occupation," and that the proper or even necessary sequence in use is first by the horse and cattle raiser, next the shepherd, and finally by the agriculturist.

* Previously cited herein.

Mr. Daireaux further states that it is now customary, in the development of plains land, to pasture them first with horses at the rate of 3,000 to 4,000 head to the 25,000 to 50,000 acres, and after two or three years to introduce cattle, which "commence a second working and fertilizing of the soil, rendered easier by the first, and lasting for six or eight years," and that the fertilized area being extended gradually, sheep are finally introduced, with small direct profit until a thick and continuous turf is formed, such being made possible by the successive working, compacting, and fertilization of the soil.

It thus appears that under human guidance a preparation of the pampas lands, to some extent, for agriculture, is being conducted, answering to that extent to the similar preparation undesignedly made by buffalo and deer of the soil of our own plains during centuries. Is it to be supposed that the results can be as favorable to agriculture in one case as in the other, upon areas of equal extent?

The extent of the grazing lands in actual use, and thus in preparation more or less for agriculture, is not easy to estimate, but as compared with the whole area of the country it can not be considerable. It was as late as 1877 that the Araucanian Indians were driven from the pampas and these were open to safe and regular pasturage. Throwing some light upon the matter of extent, Mr. Daireaux observes that the lands in the immediate vicinity of the towns are pastured to yield the towns' supplies; that beyond 4 or 5 leagues from these centers of consumption there is a zone without cattle, consisting of cultivated lands and sheep pastures, which, although of considerable extent, is still too narrow for herds; that beyond this is another zone where sheep and cattle roam together, not quite adapted to sheep alone; that farther still are vast pampan cattle ranges where the stock roams unrestricted, and beyond all this is what the people call "los campos del porvenir," the fields of the future, where there are no cattle, but troops of nearly wild horses.

From the foregoing evidence it appears that natural conditions in the Argentine plains are decidedly more favorable to stock-raising in itself, and as a preparation of the soil for other use, than to agriculture. However, as a great stimulus to agricultural production has been given during recent years by the colonization of agricultural immigrants, mostly in places convenient to water transportation, it might be supposed that agriculture is destined to early assume the leading place as a national industry, and that national inclinations and natural conditions were more or less at variance. Mr. Child has this to say, after noticing the large increase in cultivated lands during the last ten years from less than 1,000,000 to about 8,000,000 acres:

> This prodigious augmentation has caused certain prophets to foresee a near future when the cereal production of the Argentine will vie with that of the United States and Russia. This prediction is, perhaps, premature. * * * Furthermore, it is a mistake to affirm, as some foreign authorities have recently done, that there is a

marked tendency in the Argentine to substitute pastoral by* agricultural industry. In my observations of the Republic I found no traces of such a premeditated change. There are, on the contrary, several reasons why the progress of agriculture in the Argentine should henceforward be very gradual. In the first place, the pastoral industry is easier and more surely profitable; it requires less capital, less labor, and simpler means of communication than agriculture on a large scale. Secondly, the easily and cheaply accessible grain ground of the Republic is already taken up, and the occupation of more distant ground can only become profitable in proportion as railways are built and cheap freights obtained. The actual railway freights in the Argentine are a terrible obstacle to commerce. * * * In the third place, the reputation of the soil of the Argentine has been exaggerated. There are vast expanses of rich soil, but there are also vast expanses where the vegetal layer is so thin that after a few years it is exhausted, as is already the case in certain parts of the province of Buenos Ayres. The exploitation of the virgin soil in the agricultural provinces of the Argentine has, perhaps, seen its best days, and the questions of artificial fertilizers and more scientific agriculture are beginning to present themselves.

This writer also observes that, admitting an abundance of agricultural lands, still "the great obstacle will continue to be the want of capital and the want of labor."

As to the prediction which Mr. Child thinks "is, perhaps, premature," that the Argentine Republic is soon to vie with the United States and Russia in cereal production, the facts do not seem to warrant it so far as the United States and the Argentine Republic alone are concerned. Under present conditions it does not appear that the area of land suitable by climatic and soil conditions for cultivation of the cereals is great enough to insure any serious competition. The period of preparation of the soil for arable culture must continue for an indefinite time, and the necessity for a mixed agriculture, together with local advantages for the production of peculiar products, will prevent an abnormal development of cereal growing, especially in the face of the severe and present competition of the wheat fields of the world.

It nevertheless remains true that there is a considerable area, including the Argentine Mesopotamia and contiguous alluvial and other fertile lands of the Republic, considerable of Uruguay, and a smaller portion of Paraguay, where soil and average climatic conditions are very favorable to cereal production. This entire region is not so extensive, however, at the best, as to be able ever to disturb seriously the prices or international movements of grain crops, and its yield will be ultimately fully needed year after year at home and near by. As to the average climate conditions prevalent in the present wheat and maize regions of the Republic, as compared with the average in regions of similar production in the United States, the following table will show that there are no apparently remarkable differences:

* The word is "for" in the original, but the context shows that the meaning is as here indicated.

Average climatic conditions during the cereal producing period of the year in portions of the Argentine Republic and in the United States, as shown from official data.

Localities.	Seasons.	Mean temperature.	Mean precipitation.	Mean humidity.
		° *F.*	*Inches.*	*Per cent.*
Provinces of Buenos Ayres, Córdoba, and Santa Fé	Spring	59.88	8.43	71.6
	Summer	73.58	8.17	70.1
Average or total		66.73	16.60	70.8
Ohio Valley and Tennessee	Spring	65.6	12.49	64.1
	Summer	74.3	10.73	70.3
Average or total		69.9	23.22	67.2
Lower lake region	Spring	55.0	9.18	74.7
	Summer	68.0	10.64	73.8
Average or total		62.0	19.82	74.3
Upper lake region	Spring	51.2	9.79	71.8
	Summer	63.9	10.45	71.1
Average or total		57.6	20.24	71.4
Upper Mississippi Valley region	Spring	61.9	12.18	64.8
	Summer	71.8	10.86	71.3
Average or total		67.0	23.04	68.1
Missouri Valley region	Spring	60.7	11.80	64.0
	Summer	70.7	9.38	69.2
Average or total		65.7	21.18	66.6
North Pacific coast region	Spring	54.8	8.85	70.7
	Summer	61.9	5.92	67.0
Average or total		58.4	14.77	68.8

Given a productive soil and proper cultivation, these average conditions would seem to promise a substantially equal yield. A variation from this must be supposed to be the result of considerable variation from the average climatic conditions. If such variations occur as frequently as is mentioned by Dr. Burmeister relative to the province of Buenos Ayres, heretofore noted, so that two out of five or six years on an average are years of failure of cereal crops, either because of excessive drought or rain, or if the testimony of the Buenos Ayres Herald, as heretofore quoted, is substantially true, that one wheat crop in three in the Republic is a failure, then, whatever the other conditions may be, grain-raising will scarcely be extensive and regular enough in the country to supply the annual demand of the increasing population.

CONCLUSION.

The portion of the Argentine Republic which is richest in soil and has the best climate is that which approaches nearest to the tropics. This is intersected by the largest rivers and most numerous streams, and is separated from the ocean on one side by Uruguay, Brazil, and Paraguay, and on the other by Chile and Bolivia, and particularly the great Andean chain. As has been shown, the climate of Lima, near the equator, extends well down this northern part of the Republic, and

unlike the pampas it has been enriched by the continual and often abundant vegetation which has decayed or been deposited by overflow upon it. The productions secured by agriculture from this considerable region will naturally and increasingly tend to be those of such cultivated regions elsewhere, and approach the tropical, as sugar, rice, cotton, tobacco, etc., none of which are yet raised in the Republic in sufficient quantities to supply the present home demand. This region is much better for cattle, also, than for sheep, and the valuable timber is all here, except in the mountains of the southwest.

Another region, where grain and fruits, especially grapes, may be grown successfully with irrigation, and where the grasses should be nutritious and abundant enough for herds and flocks sufficient to meet local wants, includes provinces or portions thereof lying along the Andes, such as Mendoza, San Juan, etc. This region has very little rainfall, and necessary irrigation must generally come from streams derived from snow upon the mountains; and as in many cases these streams become dry annually, it is probable that water storage will become necessary to a considerable utilization of the soil in agriculture—a resort of the far future, when population and cheap transportation may encourage production on a larger scale.

As to the balance of lands, constituting the pampas generally, possibly agricultural or otherwise, perhaps sufficient has been said under other heads to give in the main a fair idea of them and their character. It is evident that they require peculiar modification to make them valuable, even for a short period, to agriculture, and that this modification requires, under the familiar conditions, the continuance and extension indefinitely of the cattle ranges.

BOLIVIA.

Bolivia secured its independence from Spain in 1825, and assumed as a nation, in honor of its liberator, Bolivar, the feminine form of his name; and the constitutional assembly having decreed on the 11th of August a republican form of government, by request he formed the first constitution. The present fundamental law, however, dates from October 28, 1880, and approaches more nearly to that of the United States. By its provisions the executive power is vested in a President, elective for a four years' term by universal suffrage, who is assisted in their spheres by two Vice-Presidents similarly elected, and by a selected cabinet of five ministers. The President appoints the prefects or governors of the several departments, answering to states of some other countries, who exercise therein supreme political, military, and administrative authority, subject to the direction of the appointing power and the laws. The departments are divided into provinces, under subprefects, there being for each provincial capital a municipal council; and the provinces are divided into cantons, under *corregidores*. Under this system, the like of which exists in several Spanish-American countries, it is evident that the powers of the Presidency may be exercised with facility and precision through the entire political system, all administrative officers being appointees of the President or of his appointees. The Vice-Presidents act only in the absence or inability of the President, and administer then in turn.

The legislative power is exercised by a Congress consisting of a Senate and a Chamber of Deputies, elected by direct vote of the people, which meets annually on the 6th of August, the anniversary of independence. There are two senators for each department, and in all 68 deputies; Congress holds ninety days of sessions annually, and members are paid $200 per month during the session, and traveling expenses.

The judicial system consists of a supreme court at the capital, Sucre, and superior courts in each of the departments, besides local courts. There is also at the capital a tribunal of accounts.

AREA AND POPULATION.

The area of Bolivia is as uncertain as that of most South American countries, as it has never been surveyed, and questions of boundary are still undetermined, possibly with Brazil, which may enlarge, and actually with the Argentine Republic, which may either diminish or leave undisturbed the present apparent limits. Only two authorities out of

nearly a dozen agree as to the extent of the country. The department of Atacama, with all the coast line possessed by the Republic, was lost through the war between it and Peru on one hand and Chile on the other, the extent of the department being 70,181 square miles, or nearly that. The Almanach de Gotha states the present area at 536,200 square miles, and the American Almanac evidently adopts that statement. The Statesman's Year Book gives the area as 772,548 square miles; the Hand Book of the American Republics as 784,554 square miles; the American Cyclopædia, printed before the loss of Atacama, 697,288* square miles (reduced by that loss to 627,107); the Encyclopædia Britannica (1878), 536,200, or, reduced as above, 466,022 square miles; while the delegate from Bolivia to the International American Conference, Señor Velarde, says in his report upon railways: "The Republic of Bolivia, with a population of 2,500,000, has an area of 55,000 square leagues, or 275,000 square kilometers."

Reduced to square miles, this gives the lowest estimate of all, viz, 106,180. These differences are not reconcilable even on the assumption that the largest statements include lands released to Brazil some years since, and the only means of obtaining a moderately satisfactory estimate appears to be to make it from the limits of present boundaries as shown in the most trustworthy maps. The map made for the report of the International American Conference upon the railways of South America is herein adopted as the basis of estimate, as it is recent (1890) and has the approval of that body, and agrees mainly with the map of Bolivia in the Scribner-Black Atlas of the World (Scribner, N. Y., 1890). By it the average extent of Bolivia east and west is 11° of 60 geographical or 69.16 English miles, and the average extent north and south is 10 such degrees. Multiplied together, these give the probable area of Bolivia as 526,141 English square miles, an area nearly 5,000 square miles greater than that contained in Washington, Oregon, Idaho, California, and Nevada combined, or three and a third times the size of California.

Statements of the population of Bolivia are as various as are those of its area. Señor Velarde says, as before stated, that the population amounts to 2,500,000. The Hand Book of the American Republics, of February, 1891, says the "population, according to the last census,† is 2,333,350 inhabitants, of whom 1,000,000 are aborigines or Indians of pure blood; 700,000 half castes; and the other 600,000 of creoles, descendants of Europeans." Our consul-general to Bolivia in 1885, William A. Seay, in a dispatch to the Department of State,‡ gives the population as 1,982,079, and must have obtained his information from the authorities at La Paz. The Stateman's Year Book for 1891 estimates

* The table of areas of departments in the American Cyclopædia foots up as here stated, and the total is wrong in that work by 20,000 square miles.

† Date of census not given, however.

‡ Consular Report No. 60, January, 1886.

the population at 2,300,000, of which a million are Indians. Probably the statement given in the Hand Book of the American Republics is nearest correct, and is adopted as such in the aggregate and by departments in the following table:

Department.	Area.*	Population.	Capital.	Population.†
Beni	125,000	68,650	Trinidad	4,835
Chuquisaca	61,070	360,680	Sucre‡	26,664
Cochabamba	22,492	450,300	Cochabamba	44,908
La Paz	36,120	642,650	La Paz	83,092
Oruro	18,122	170,000	Oruro	8,492
Potosi	45,555	300,000	Potosi	25,774
Santa Cruz	120,880	200,500	Santa Cruz	11,736
Tarija	96,052	140,560	Tarija	8,375
Total	526,141	2,333,340		

* Approximate.
† In 1865. The changes since are slight.
‡ And capital of the Republic. The department is also sometimes called Sucre. However, La Paz is practically the capital, being the residence of the Government.

PHYSICAL CHARACTERISTICS.

Bounded north by Brazil, east by Brazil and Paraguay, south by Paraguay and the Argentine Republic, and west by Chile and Peru, Bolivia extends down the eastern slope of the coast chain of the Andes, across table-lands and a portion of the main Andean chain, and over extensive plains, portions of which are inundated during the wet season and other parts dotted with lagoons and marshes, nearly to the boundary and level of the great river Madeira, a principal tributary of the Amazon, to the northeast, and to the Pilcomayo and Paraguay Rivers on the east and south, the longest portion of the course of the former stream toward the latter being through Bolivian soil. Thus the western and central portions are mountainous, and the others belong respectively to the great basins of the Amazon and the Paraguay. The whole country lies between 8° south of the equator and the tropic of Capricorn, and is thus by position entirely tropical, but throughout about a third of its area the climate is modified more or less by elevation of the land, Bolivia containing the highest mountains in the Andean range. Says the article upon Bolivia in the Encyclopædia Britannica relative to this and the eastern range:

In Bolivia it attains an average height of 15,000 feet, and has a general width of 20 miles, having its highest known point here in the volcano of Sahama, 23,000 feet in elevation. Next follows the central system of the *Cordillera Real*, also named the Eastern Cordillera, presenting a succession of sharp, rugged peaks, reaching up into the region of eternal ice and snow, higher generally than the Andes but less massive; the peaks of Illimani (21,300 feet) and Sorata (24,800 feet) are its culminating points. Between the Andes and the Cordillera Real there are various *Serrania* or isolated groups of mountains and single cerros of less altitude rising from the inclosed plateau to 17,000 feet in some instances. The last system is that of the numerous minor cordilleras, which run southeastward from the Cordillera Real into the lowlands of eastern Bolivia. * * * The elevation of the snow line in the highlands of Bolivia appears to vary between 16,000 and 18,000 feet, modified in many cases by the aspect of the mountains and the nature of the country surrounding them. * * *

These mountain systems divide Bolivia into a high region, containing many elevated plains stretching between the inclosing heights of the west, and a low land forming the eastern side of the country,* beneath the mountains, and at a comparatively small elevation above the sea. The high plains or basins of the plateau inclose a continental water system, from which there is no outlet to the ocean, the rivers terminating in lakes, of which Lake Titicaca is the chief, or in swamps or in vast dried-up salt fields, rapid evaporation disposing of and balancing the supply of water flowing to these by the mountain streams.

The valley or plateau which is occupied by the Lake of Titicaca and the Rio Desaguadero forms the most elevated table-land in the globe, with the exception of that of Thibet, which presents only mountain pastures, covered with sheep, while this table-land of the New World presents towns and populous cities, affords support to numerous herds of cattle, llamas, guanacos, and sheep, and is covered with harvests of maize, rye, barley, and wheat, at an elevation which has nothing to equal it in any other part of the world. The Lake of Titicaca or Chuquito, which occupies its northern extremity, is 12,600 feet above the level of the sea, and its extent is equal to fourteen times that of the Lake of Geneva, or 3,220 square miles, the greatest depth being upwards of 700 feet. It is surrounded by numerous towns and villages, and a rich and fertile country, etc.

Consul-General Seay, in the dispatch before alluded to, in characterizing different parts of Bolivia as to climate, indicates other characteristics, of topography, elevation, and production, as well. His statement is as follows:

Bolivia may be divided into three regions with regard to climate, and consequently with different agricultural products in each.

(1) *The warm region.*—This embraces the departments of La Paz and Cochabamba and the Yungas district, in which are cultivated the famous plant coca, to whose leaves are ascribed almost magical medicinal powers, the tropical fruits in great varieties, a species of coffee said to be superior to the mocha,† the sugar cane, the cacao, cotton and rice to a limited extent, and other products of similar regions.

(2) *The valleys or regions with a temperate climate.*—The leading productions of these regions are their fine fruits of many varieties and a profusion of garden vegetables, cultivated with skill and carefulness. The vine thrives, producing many varieties of grape, from which very good wines are manufactured. The department of Santa Cruz de la Sierra produces a good sugar in sufficient quantities to supply a great part of southern Bolivia. The department of Cochabamba produces in great quantities the cereals, such as maize, wheat, etc. Until within a few years past this region supplied the whole country with flour. There would still be enough for home consumption were it not for the large exportation to Chile and Peru.

(3) *The cold region, or Puna, as it is called.*—This embraces the lofty table-lands, sometimes reaching to the height of nearly 14,000 feet above the level of the sea. It is quite cold on them all the year round. Frost is formed on them almost every night. They are almost entirely destitute of native vegetation, and yet they produce barley, potatoes, and numerous other garden vegetables.

Relative to the classification of departments according to their peculiar character and consequent leading productions, the Encyclopædia Britannica states as follows:

The westerly departments of La Paz, Oruro, and Potosi are situated in the highest regions of the plateau of Bolivia, and are more valuable on account of their mineral

*And also the southeast.

† It is difficult to imagine how an American or European can compare any other coffee with real mocha, which has not entered their markets in 50 years.

riches than for their vegetable products, of which a coarse grass is characteristic. The first consists of a series of high ranges and deep valleys, in which the climate and production vary with the elevation; the second lies also in the high table-land or Puna region. Both are rich in veins of gold, silver, and tin, but the mining of these has not yet been fully developed. The third, Potosi, belongs entirely to the highest regions of Bolivia, and is bare and dry, with a cold and rude but healthy climate. This is the greatest mining region of the country.

The central departments of Cochabamba, Chuquisaca, and Tarija lie partly on the high plateau, partly on the lower slopes and plains eastward, and pass thus through the whole series of changing climates and zones of production, from the bare highland to the tropical regions of the lowlands. The first is eminently the granary of Bolivia and southern Peru, excelling in the cultivation of wheat. * * * Chuquisaca, of which only a third part lies in the highland, is also a vegetable-growing region, in which wheat, barley, rice, peas, vines, and all sorts of vegetables are cultivated. Cattle and horses are also numerous. The forests of this department and of Tarija, which slope down to the wooded and pastoral plains of the tributaries of the Paraguay, afford many species of valuable timber.

The departments of Beni (or Veni) and Santa Cruz de la Sierra lie altogether in the lowlands of the east, stretching to the Rio Madeira and the Paraguay. The former is as yet little explored, but is a land of tropical forests, rivers, and swamps, with an unhealthy climate. Santa Cruz is also characterized by a hot, damp atmosphere, but produces garden and field fruits in astonishing richness—coffee, cocoa, vanilla, sugar cane, maize, and cotton. The forests of both of these departments afford an infinity of valuable timber trees, and in the latter there is much pasture land well fitted for cattle-breeding.

The soil of Bolivia is similar in character to that of Peru and Ecuador, nd portions of Brazil, more fully described in other articles of this series. It is therefore in part of volcanic origin, in part of detritus from the mountain masses mixed with decayed vegetation, and on the plains it is principally alluvial. Of the lands of the whole country it has been estimated by the best Bolivian statists, as reported by Consul-General Seay, that over one-half is susceptible of cultivation. That gentleman says, in a dispatch before cited:

> While most of the territory on the mountains, hills, and pampas is either barren or poor, most of that towards the east and in the valleys is of unsurpassed fertility. There are places which, though at an elevation almost reaching the region of perpetual snow, produce, notwithstanding, potatoes, peruvian bark, barley, grasses for pasturage, and many horticultural products. Such is the case in the province of Oruro, 13,300 feet above the level of the sea. * * * Bolivia has unsurpassed agricultural resources. There are no better lands or climate in the world than those of which eastern Bolivia can boast. Yet one can see very little prospect of her becoming a great agricultural country for many years to come.

CLIMATIC FEATURES.

Often it is not possible to quote authorities upon one essential point without including incidental remarks upon other points, so that already many facts relating to the peculiar climate of Bolivia have herein been presented. More particularly it may be stated that the regions above 12,500 feet are generally so cold as to be uninhabited and nearly unproductive of vegetation, except hardy grasses and mosses. These regions

are called *Puna brava.** Next below these comes what is termed the *Puna*, which includes the high plains above 11,000 feet, most of which are "scantily peopled or cultivated." In the heads of the valleys, descending from 11,000 to 9,500 feet in elevation, the climate is temperate, and here wheat, maize, and ordinary vegetables are raised. In the deeper portion of the valleys, called *Valle* or *Medio Yunga*, down to 5,000 feet, the climate is warm, and field and garden yield fruits abundantly. Last is the low tropical region below 5,000 feet of elevation, called the *Yunga*, producing all kinds of tropical vegetation and fruits.

Not more than half of Bolivia has a tropical climate, although nearly [quite] the whole republic is within the tropics. In the valley of the Desaguadero extremes of heat and cold are unknown. The year is divided into two seasons—the wet or summer, from November to April, when rain falls almost every day and the nights are cold, with occasional frost; and the winter, from May to October, when snow and rain are never seen. The summer is preceded and followed by snowstorms. This valley is generally salubrious. The cold in the higher mountain regions is extreme; hail and thunder storms are frequent and terrific. * * * In the lowlands south of the Cordillera Real the heat is oppressive in many of the valleys, and intermittent fevers are common.†

The only records of temperature for any continuous time to be found for any part of Bolivia are those made by Lieut. Gibbon, of the Herndon expedition of 1851–'52, from observations made twice a day, at 9 a. m. and 3 p. m., during the most of December, 1851, and January, February, March, and April, 1852, at Cochabamba, which city is situated in latitude 17° 27′ S. and longitude 65° 46′ W., and is 8,370 feet above sea level. These observations probably give no very accurate idea of the average temperature of the days of the month named, but only an approximate one. From them, however, the average day temperature of December appears to have been 72.23° F.; of January, 65.80°; of February, 64.75°; of March, 65.47°; and of April, 69.66°. Average temperature of the day for the five months, 67.58°. These observations were taken in the rainy summer season, and the accompanying daily notes show that nearly every day was cloudy and the largest proportion of the time rainy, while the records of thunder and lightning and snow on the mountains are numerous, with one heavy earthquake shock and an accompanying smell of sulphur.

AGRICULTURAL PRODUCTIONS.

The range of agricultural production in Bolivia is particularly remarkable for extent and variety. Nowhere else in the known world within a similar breadth of area, except perhaps in northern India, can every vegetable production of the land be propagated naturally; and nowhere else, with the same possible exception, is there such variety of products of the different climates on so considerable scale within a similar area. And, in addition, Bolivia surpasses any part of the Himalaya region in

* Puna means a region uninhabitable because of cold, hence the high regions of Boliva, etc. Brava means wild, fierce, in this instance.

†American Cyclopædia, article Bolivia.

the natural utilization of its inhospitable mountain elevations by several millions of exceedingly useful animals of the llama and allied species. The range of possibilities of plant production, as shown to some extent in extracts from authorities under the preceding head, is from the purely tropical of the lowlands, through the subtropical of the lower valleys, the temperate of the valley heads and lower plateaus, and the subarctic of the punas to the arctic of the punas bravas and the regions of perpetual snow and ice, through climates of elevation instead of extent covering the climatic scale.

Among the vegetable productions are the potato, which grows wild in many parts; quinoa (*Chenopodium quinoa*), sometimes used as a substitute for the potato; the various cereals, and nearly all the fruits of the tropical and temperate zones. Cotton grows wild and is of two kinds, yellow and white, both of a fine, long staple; the sugar cane is raised to a considerable extent; the coffee of the Yungas Valley is of excellent quality; cacao is abundant on the Beni, and considered to be superior to that of Guayaquil; and the same province and Santa Cruz produce tobacco reputed equal to that of Havana. But perhaps the most important product of Bolivia is the coca, the annual sales of which in the market of La Paz amount to $4,000,000. It grows extensively along the east slope of the Andes, between 5,000 and 6,000 feet above the sea. It is used by the Indians as betel is by the Asiatics and kava by the South Sea islanders, and a refreshing tea is also made from it.

The country produces in abundance copaiba, sarsaparilla, jalap, valerian, ipecacuanha, and other medicinal drugs; the *canela de clavo*, a species of cinnamon; and many varieties of gums, caoutchouc being abundant and of excellent quality. The fertile strips toward the coast, besides many of the intertropical products already mentioned, yield yucca, maize, and algarrobas, and the *Arundo donax* is cultivated. There are vast indigo fields, cochineal is produced, and flax, once prohibited by Spain, is now largely raised. Dyewoods are numerous, and the dense forests afford timber of great beauty, such as ebony, rosewood, mahogany, cedar, Brazil, and a variety of woods not commonly known. The slopes of the Andes are to an immense elevation covered with magnificent trees; here and in the valleys and in the ravines of the mountains abound cinchona trees, and especially the valuable *C. calisaya*. * * * The various species of cacti, acacias, and palms are found in their respective zones; and also the *maté*, or Paraguay tea, and a kind of mulberry, from the fibers of which the Indians prepare a beautiful yarn for shirts. * * * The lower districts are clothed with a beautiful green turf, and the valleys with coarse grass very good for pasture.*

Consul-General Seay estimated the number of quinia trees in the plantations of Bolivia in 1885 at 5,000,000 and the value of coca raised in 1884 at $1,718,330 in money of the United States.† He also states that the coffee of that country is of great strength and excellent aroma, that it possesses the great merit of being exportable in the outside covering without injury, and that probably two-thirds of the cultivable land of the Republic is adapted to coffee-culture. The amount produced now, 400,000 pounds per year, with no means of supplying foreign demand

* American Cyclopædia, art. Bolivia.

† Minister Gibbs names two estates having each 2,000,000 cinchona trees, and estimates, probably more correctly, the total number at 6,500,000.—Consular Reports, No. 54.

for want of transportation, is below the needs of the home market, coffee selling in La Paz in 1885 at 22½ cents per pound at retail.*

As Bolivia publishes no statistics of agriculture or commerce, no complete showing can be made under these branches. As to present and actual agricultural production, the mountain region, to which the principal or mineral industry draws the bulk of the effective population, is of most interest, the region next below and also partly inclusive of the puna. A detailed statement of many of the ordinary productions of this part of the country, as well as of portions of Peru and Ecuador, will therefore be of interest in several respects. Such a statement may be found in the Travels in the North of Bolivia, etc., by Dr. H. A. Weddell, traveling naturalist of the Museum of Natural History of Paris, chevalier, etc., published in Paris in 1853. His chief point of observation was the capital, La Paz, and the following notes are translated for this article:

We had, as will be remembered, to descend a declivity of nearly 1,000 meters (3,281 feet) upon our approach to La Paz. Upon the *puna* or plateau at the summit of this declivity no fruit, properly so called, grows.

La Paz, which lies at the foot of the descent, is in the upper part of a valley (Quebrada de La Paz) which gradually slopes to the southeast in the direction of Mount Illimani, around the base of which it passes before traversing the Cordilleras and joining the tropical valleys of the province of Yungas.

The climate of La Paz is such as the Bolivians call "cabeza del valle" (head of the valley). Its mean annual temperature is about 10° C. (50° F.), or somewhat less than that of Paris, generally reckoned at 10.8° C. (51.4° F.). The annual range of temperature at La Paz, however, is very different from that of Paris, being less hot in summer and less cold in winter. The result of a long series of observations made in this part of Bolivia and communicated to me show the extremes of temperature to be from —7° C. (+19.4° F.) to 23° C. (73.4° F.). In 1850 the lowest temperature observed in June, there the coldest of the year, was only —4.44° C. (+24° F.), while at Paris hardly a winter passes when the thermometer does not fall below —10° C. (+14° F.). It might be concluded from these data that the temperature of La Paz is quite uniform, and such, indeed, would be the case did not the usual clearness of the sky render loss of heat by radiation very considerable, so that the nights are generally much colder than the day; while in consequence pulmonary diseases are quite prevalent there.

Though the thermometer frequently falls below the freezing point at La Paz, plants are rarely frozen. This is because at this great height the air is very dry.

I was led to notice this by the fact that the Indians, when preparing chuño, are obliged to wet their potatoes in order to make them freeze.

There are several species of cactus growing abundantly in the environs of the town and sustaining without injury all changes of temperature. As an experiment it occurred to me to water one of these plants for several consecutive nights. It was attacked by the cold and turned yellow.

The elder is one of five or six trees commonly found at La Paz. These trees, together with a few apple trees in the public square, retain their leaves throughout the winter. But with these advantages, so especially valuable to horticulture, La Paz has the disadvantage of a cool summer. This explains why the number of local plants available for agricultural purposes is so limited. Following is a catalogue of the principal fruits, etc., to be found in the market at La Paz at various times. It will be seen, for example, that only five or six different fruits ripen in the open air,

* Consular Reports, No. 82, 1886.

while at Paris there are a dozen such, at least. Lower down the *quebrada*,* however, several leagues from La Paz, fruits are found which Paris can not produce.

Peaches.—Of these there are several varieties, similar to those grown upon trellises in France; they sell at the rate of about 2 dozen for a *medio*, or 5 cents. Peaches are never grown upon trellises in Bolivia.

Pears.—These are of two kinds, the commonest being an English variety. They sell in March for a *medio* the hundred.

Apples.—There are but one or two varieties of these, which are a little less common than pears, but bring the same price as peaches.

Quinces.—These are less abundant than the preceding.

Tunas or Indian figs.—The fruit of the *Opuntia vulgaris;* price, 25 for a *medio*.

Strawberries.—There is but one variety, a Chilian one, but it is large and abundant.

The above fruits are cultivated within a radius of 1 or 2 leagues from La Paz.

Grapes.—The black grape is much more common than the white. The berries of the black grape are ovoid and tolerably large, but have a very thick pellicle. The fruit matures best at about 5 leagues distance (say 15 miles) from the town. The earliest grapes brought to market come from 12 leagues away; they are often ripe from December onward. In February the grapes of Guaricana, a large farm 8 leagues from La Paz, are harvested. Lastly come those from around the village of Mécapaca, only 6 leagues away. The pruning of the vines is done towards the middle of August.

Figs.—The large brown variety is the only one to be seen at La Paz. This, in the same climate with the grape, yields two crops yearly. The figs which appear at the commencement of the rainy season are the largest and are called *breras*. The others, of more ordinary quality, appear in February and March.

Pacaes.—These are the pods of a tree belonging to the genus *Inga*, the seeds of which are surrounded by a sweet white pulp which is very refreshing. The fruit is abundant in all the warm regions of Bolivia.

Melons.—These are quite similar to those of France and are cultivated in the same localities as the watermelons.

Watermelons.—These have both red and white pulp and are very plentiful in August. They grow in the same region as the grapes, but much less well than in a warmer climate.

Pepino.—An insipid fruit, looking externally like some of the egg plants; they are found in the same region as the watermelons and can be eaten raw.

Oranges.—[These, like those of Paraguay, are chiefly of excellent quality.]

Sweet limes.—[These are also excellent.]

Lemons.—Of these there are two kinds; one is of the size of a nut and extremely acid; the other is the ordinary lemon.

Citrons.—These are used, as in France, for preserving.

These last four fruits, as well as the *Bigarade*, are abundant in all the warm valleys of the eastern slope of the Cordilleras, known as the Yungas, whence they are daily brought to La Paz, packed in hay.

The Avocate Pear is one of the finest of tropical fruits and is common in the Yungas.

Bananas.—Several varieties of these are brought in great abundance from the Yungas.

Chirimoya.—These are the fruits of the *Anona*, and there are two varieties, esteemed as among the best of Bolivian fruits. One is smooth, the custard apple, and the other, the sweet sop, is squamous.

Pineapples are abundant in the Yungas, selling there at 5 cents apiece, but when brought to La Paz they sell at from 20 to 40 cents apiece. They are as highly fragrant as those of Guayaquil.

Granadillas.—These are the fruits of several species of *Passiflora*, and are plentifully brought to La Paz from the Yungas.

* Quebrada: broken or unequally elevated lands between mountains.

Peanuts.—Extensively cultivated in the Yungas and especially employed in the preparation of *chicha*, a fermented drink, very common in this part of the world.

Among the commoner vegetables found in the markets at La Paz were:

Potatoes.—Generally smaller than those found in France. The principal variety is round, and of a yellowish, rose, or violet color. The potato is cultivated in the environs of La Paz, and sells for from 9 to 10 reals the sack of 5 arroba (*i. e.*, 90 cents to $1 for 125 pounds).

Amargas or "*bitter*" *potatoes.*—These are of a pale dirty-yellow color, generally slightly flattened in form. They may be cultivated in the coldest plateau, and in soils where nothing else will grow. Their characteristic acrid taste is not very pronounced, yet can not be entirely removed by boiling; neither can its hardness, which is greater than that of the ordinary potato. Very few persons except Indians eat this tuber, and even they use it in the form of *chuño.** It has not been observed whether the plant which produces the *amarga* differs botanically from the ordinary potato, though it probably does, considering the different climate in which it thrives.

In Peru and similar countries the preservation of potatoes in the form of *chuño* offers incontestable advantages, and is even indispensable. In Europe, where conditions are different, *chuño* would be made merely as a curiosity, and besides its manufacture would be very much less easy elsewhere than on the plateaus of the Andes, owing to the difficulty of freezing the potatoes without recourse to artificial means. At great altitudes, in fact, evaporation is more rapid, owing to diminished pressure, and is further advanced by the intensity of the heat during the daytime.

Another method of preserving potatoes is practiced in Bolivia, namely, by boiling and peeling them, and then allowing them to dry in the air. This preparation goes by the name of *cucupa*.

Ullucos.—These are the tubers of the *Ullucus tuberosus*, which resemble some potatoes in form and color. These are the least desirable of all vegetables in the South American markets, so that it is difficult to understand how they come to be so appreciated in Europe as a succedaneum for the potato. Their only advantage seems to be that they can withstand rigorous climates, and therefore may be cultivated at higher elevation than the ordinary potatoes.

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* A word upon the preparation of *chuño*. In the higher Andes it freezes nearly every night in the year, and as the natives have no means of preserving their potatoes from the frost they are often obliged to eat them in a frozen state or not at all. Therefore, instead of allowing them to freeze naturally, they freeze them in such a way that no portion is left unfrozen, after which they dry them thoroughly. The *chuño* thus made may be kept indefinitely without losing any of its nutritive qualities, and is even said to be thus rendered more digestible. The taste of the potato is completely altered, yet without having been made disagreeable.

There are two varieties of *chuño* made from potatoes, the black and the white. To make the first variety the potatoes are spread in the open air upon a thin bed of straw, and then slightly sprinkled with water and exposed to the cold for three consecutive nights. By subsequent thawing in the sunlight they become of a spongy consistency, and are then rubbed, generally by the bare feet, in order to remove the skins and to express the juice; they are then thoroughly dried in the open air, becoming of a dark brown color.

To prepare white *chuño* the potatoes after freezing must be macerated for a fortnight in running water. To do this slight hollows are made in the bed of a stream and filled with freshly frozen potatoes in such a way that the water can flow freely over them; upon subsequent drying the *chuño* is perfectly white. The taste of the white *chuño* is less pronounced than that of the black, yet although it is the most delicate, the black variety is the one most generally preferred. The latter has one inconvenience, however, *i. e.*, that it must be soaked in water for six or eight days before using, whereas the white *chuño* needs but thirty-six hours of such soaking in order to soften it.

Ocas.—Tubers of the *Oxalis tuberosa*, which is extensively cultivated in the more temperate plateaus. There are several varieties, of which the red and white are the principal, the white being the most esteemed. Ocas, when freshly gathered, are always more or less acid, and can not be eaten in this condition; their acidity can, however, be eliminated by prolonged exposure to sunlight,* whereby a change similar to that of the ripening of fruits takes place, so that the tuber becomes perfectly neutral and often as farinaceous as the best potato. Some varieties resemble the chestnut in flavor.

The *Oxalis tuberosa* acquires in Bolivia a quality which it does not seem to have in France, namely, its multiplication is more abundant than that of the potato. Therefore the sack containing 4 to 5 arrobas of ocas costs but 4 or 5 reals (*i. e.*, 40 to 50 cents for 100 to 125 pounds), while the price of the same weight of potatoes is double this.

Ysaño.—This is the tuberculo of the *Tropæolum tuberosum*. It is cultivated in the open fields about La Paz, but in Europe is regarded as almost worthless. In fact when freshly gathered it is disagreeably acrid and possesses in a high degree the characteristic odor of the nasturtium; but the Bolivians have found a method of removing the objectionable qualities, so that now the *Ysaño* has become a perfectly comestible vegetable, if not one in ordinary use. This method consists in freezing them after having cooked them. They must, however, be eaten before they thaw, and while still crisp. Ysaños thus prepared, and called *taiachas*, are for sale in the markets, being kept frozen by a covering of wool and straw. The señoritas of Bolivia are said to be particularly fond of them as a refreshment during the heat of the day.

Racachas.—These are the roots of the *Arracacha esculenta*, and are cultivated in the temperate and warm valleys. When cooked they have a taste like that of the parsnip, but are rather more farinaceous.

Ajipas.—These are tubercules brought in great quantities to the market of La Paz, but the botanical origin of which I am unable to determine. They have the form of large dahlia roots, and perhaps belong to some plant of the same family. There are two varieties of them: one wholly white, the other of a violet color when peeled. This last is the most esteemed. Both varieties may be eaten raw, and have a flavor somewhat like that of the turnip. They contain, however, much fecula. It is said that in the time of the Incas much circumstance was made of the *ajipa*, and that no pains were spared for its cultivation. In the environs of Cotaña, at the foot of Mount Illimani, where the climate is particularly favorable for the cultivation of this plant, the ancient inhabitants had the patience to conduct an irrigation canal for the distance of 3 leagues in order to water their fields.

Yacon or *aricoma.*—This is another tuber, and may be eaten raw like the preceding, and is also native to the temperate valleys. It differs, however, in being thicker,

* The exposure to sunlight should continue from six to ten days, or more, according to the variety of the oca used. The operation is best performed in large woolen sacks, which should contain but few of the tubers so that they shall form but a thin layer when spread upon the ground. When the action of sunlight is continued for a much longer time, as for several months, the ripening of the tubers goes further, and the oca looses most of its juice, and becomes of the consistency of a fig, with a strongly pronounced sweet taste. In this state the oca is called *caui*, and must be cooked by the application of steam. Of course in these operations of exposing the oca to sunlight, care must be taken not to freeze them. In the manufacture of *caia*, or *chuño* of *ocas*, however, freezing is indispensable. This preparation is made in the same manner as that from potatoes, except that the maceration of the frozen tubers is not done in running, but in still water. Thus treated the oca partially decays, acquiring an odor comparable to that of cheese. The Indians are very fond of *caia*, and consume large quantities of it.

and in having somewhat the form of a sweet potato, and a darker skin. Its flesh is watery and sweet, and appears to contain but little fecula. The taste is more agreeable than that of the ajipas, somewhat resembling that of a pear. It is said that *aricomas* sometimes grow to the weight of 4 pounds, each plant producing four or five tubers.

Onions.—The cultivation of these is one of the most important in the environs of La Paz. *Garlic* also is common in the same localities.

Sweet potatoes.—These are abundant in all the farms of the Yungas, and are of several different colors.

Manioc (*Yuca*).—The root of the *Jatropha janipha.* The *Jatropha manihot* is apparently not cultivated in Bolivia. Its root is distinguished from that of the *Jatropha janipha* in being scarcely fibrous, and in containing a poisonous juice. It is the variety commonest in Brazil and in the Antilles.

Hachipa, or achicha.—The root of the *Canna edulis,* which is cultivated in the Yungas, and in certain valleys. A wild variety of *canna,* of which the root or rhizome is eaten, is called *achira* in the Yungas.

Gualusa.—The root of the *Colocasia esculenta.* This is quite common in the Yungas, and is gathered in February and March. The young leaves are eaten like spinach.

Windsor Beans.—Abundantly grown around La Paz, the stalks frequently attaining 4½ feet in height.

Green Peas.—Sparingly grown about the town.

Chick-peas.—These are brought from Chile.

Quinoa.—This is the seed of the *Chenopodium quinoa,* which is abundantly grown in all the plateaus, and of which there are several varieties. At La Paz the stalks of this plant grow nearly a meter in height. The young plant is eaten like spinach under the name of *yuyu.*

Cañaba.—The seed of an undescribed (?) variety of *chenopodium* very similar to *C. quinoa.*

Barley is cultivated everywhere in the environs of the town, and used for fodder for cattle both in its green state and as grain. The torrefied grain, reduced to flour and mixed with a certain proportion of powdered sugar, forms a favorite aliment for the traveler in Bolivia.

Lucerne or *alfalfa* is extensively cultivated as a fodder plant in all the temperate parts of Bolivia—*i. e.,* in those regions where the grape will ripen, but it does not succeed in the climate of La Paz or in the valleys.

Wheat.—It grows well in many places not far from La Paz, but there is but one variety known there, which is bearded. The flour is used as elsewhere in the world and the whole or broken grain is also utilized in cooking. The price of wheat flour at La Paz is from $8 to $10 for a fanega of 200 to 250 pounds. In ordinary times a loaf of bread weighing 7 ounces is sold for 2 cents, or three such loaves are sold for a *medio* (5 cents).

Rice.—This is cultivated upon a large scale in the Yungas and is of two varieties, white and colored.

Maize is cultivated in the environs of La Paz, though it does not ripen well there. It is generally gathered green, as in the United States, and is cooked in various ways. There are many different colored varieties of maize at La Paz, and sometimes several colors may be seen upon one ear. One remarkable variety is the *Maiz morado* or *Culli* of the Aymaras, which is of a mulberry color, and is often used to color liquors, etc. The *Maiz blanco,* with a soft, white grain, and the *Chulqui,* the grain of which is translucid, are preferred to all other varieties for the preparation of *tostado* or torrefied maize, which replaces bread in many localities. In the valleys near La Paz the ears of maize are but half the size of those grown upon the Yungas, where the plant often attains a height of 3 or 4 meters (9 to 13 feet) and generally bears three ears to a stalk. The variety most often cultivated is one with a hard, yellow grain, which is less exposed to the attacks of insects; it is this variety which is used for making *chicha.*

Cabbages and *cauliflowers* are cultivated in the environs of La Paz, and although very small, cost from a medio to a real (5 to 10 cents) each.

Tomatoes.—A variety without corrugations is very abundant at La Paz. Several varieties of *pumpkin* and of *lettuce* succeed well there, and there is a variety of *cress*, the stalk and leaves of a small *mimulus*, which grows wild in the brooks about the town, though the ordinary French cress is unknown there. Other vegetables common in France, such as turnips, carrots, parsnips, spinach, chicory, celery, etc., are almost unknown at La Paz, although they might easily be grown there. Artichokes and radishes may be seen in a few private gardens.

Cochayuyu.—This is an aquatic plant found floating upon the surface of pools in the marshes among the Cordilleras, and is much appreciated in Bolivia and Peru as a seasoning for dishes, etc. A marine plant bearing the same name is used upon the coast of Peru. The Cochayuyu when cooked has a flavor somewhat like that of the lettuce; in order to make it tender the juice of a lemon should be added to the water in which it is boiled, or the plant should be slightly baked before boiling.

Pimento.—Fruit of a species of *Capsicum*, and much used in flavoring. There are several varieties, all found in the valleys of Yungas, the most piquant being that called *Ulupiqua*, having the size and form of a pea, with a red or green color. That called *Locoto* is the size of a small egg, and is nearly as strong in flavor as the preceding. The *Chinche* resembles the *Ulupiqua*, but is larger. The *Aji verde* is long and pointed and is less piquant than the above varieties, but is deliciously perfumed and of a fine red color when ripe. A somewhat larger variety of this is brought dried from Peru, and has an orange shade. The *Aji palpa* is of a dark red, almost black when dried, and is used for coloring dishes, etc., since its piquant taste is barely perceptible; it grows to the length of about 4 inches. Two other vegetable substances are used for giving color to rice, etc., instead of saffron, as used by the Spanish, namely, *Annatto* and the root of the *Escobedia scabrifolia*. Other vegetable condiments used at La Paz are parsely, the *Yerba buena* (*Mentha viridis*), the *Payco* (*Chenopodium ambrosioides*), and several odorous umbelliferæ.

As the foregoing articles relate to table use principally, the following from the same source and connection relative to food products is added, with a few accompanying recipes not found in American books on cookery, and which nevertheless may be so modified by substitution as to be more widely valuable:

The study of animal provisions at La Paz offers much less of interest than those of a vegetable nature reviewed above. There are five or six varieties of fish of very ordinary quality, which come from Lake Titicaca, and which are principally *Orestias* or *Silures*. There is also beef, mutton, and pork. Poultry is comparatively rare, chickens being, so to speak, the only poultry to be found. Turkeys are almost unknown, and so are ducks, and the domestic goose is even rarer. The common rabbit, called in Bolivia *conejo de Castilla*, is hardly more than a curiosity there, and is replaced at table by the *mountain cavy* or "cochon d'Inde." This animal is habitually brought up in Bolivian kitchens, where he is fattened for killing.

A few wild doves, several varieties of partridge, and two or three other sorts of game, serve now and then to increase the list of Bolivian table delicacies. Finally there are the *Caucau*, or roe of a certain salt-water fish, and the *Chichi*, or aquatic larvæ of a certain dipterous insect, which are found in abundance in the streams of the plateaus, and which are made up into a sort of spiced ragout. Butter is rare at La Paz, though two kinds of white cheese are common. Finally the mineral kingdom also contributes to the Bolivian markets. A sort of unctuous light gray clay, to which the name of *pahsa* is given, is much sold at La Paz to the Indians, who are its only consumers. They generally eat it with the bitter potatoes above mentioned, forming a thin paste of it with water, and seasoning it with a little salt. Its taste

is that of ordinary clay. At Chuquisaca small confections are made of a similar clay, called *chaco*, which are eaten like chocolate. The moderate use of these clays seems to cause no harm, but they certainly have no alimentary value.

BOLIVIAN COOKING RECIPES.

Milk soup.—Take one pullet, cut in pieces; one crawfish, dried in the oven; two handfuls of chick-peas; eight eggs. Cook each of these separately (the eggs should be hard-boiled), pour them together in boiling milk, and season with salt.

Spiced rabbit or cavy.—Take 1 spoonful (tablespoon?) of lard; 6 potatoes, cut fine; 6 onions, also cut fine; 4 hard-boiled eggs; pepper and salt to the taste; 4 red pimentos, seeded and washed and ground, and 4 rabbits (cavies), cut into pieces and fried. Stew together the first 6 ingredients with a little water, add the rabbits, and remove from the fire as soon as the whole begins to boil.

"Spiced Absurdity."—Take a handful of *cochayuyu;* 6 dried crawfish; 1 *boga* (a small fish like a herring, but smaller); 6 dried *ispis* (very small fish from Lake Titicaca); 5 minced onions; 2 tablespoonfuls of green English beans; 4 ounces of cheese; 2 tablespoonfuls of olive oil; 6 pimentos, seeded and washed; and then boil together in water the onions, beans, crawfish, and other fish, and let them drain. Add the *cochayuyu*, pimento, and cheese, and then the oil; garnish with a handful of caucau, which should be separately boiled, and serve hot.

Blanc-mange.—Take 2 pounds of milk and 1 pound of sugar and boil together until of the consistency of a sirup; add a dozen sweet almonds, well ground, and as many chirimoya seeds, and continue to boil gently until the liquid will solidify upon cooling. The chirimoya seeds are not indispensable, and may be replaced by a confection of the same fruit, or more almonds may be used.

The foregoing list and descriptions illustrate, not for Bolivia alone, but for considerable portions of tropical America, the character of many comestibles common there and little known to us, which help to limit demands upon the products of agriculture of other countries, yet which may become of foreign demand when intercourse is rapid and cheap. At present Boliva, so rich in natural resources and isolated from foreign commerce, except principally in its metal products, contributes less of its articles subject to cultivation to other countries, and is less dependent for such upon them than any other nation of the New World, except Paraguay. This is to a considerable extent due to lack of communications with differing climates, partly to the self-sustaining character of its soil productions, to its habitual attention to mining industries, and finally to scarcity of an enterprising agricultural population.

DOMESTIC AND USEFUL ANIMALS.

No census of these is known, although several classes are abundant. Thousands of cattle of the old Spanish breed are pastured on the savannas and in the mountains. The number of sheep upon the table-lands or punas is estimated at 7 or 8 millions. Horses, asses, mules, and goats are raised in sufficient numbers to meet a constant home demand. The llama is the principal beast of burden in the high mountain regions, and large flocks of these and the kindred vicuña, guanaco, and alpaca roam the elevated regions, usually in a wild state, and from them considerable fine wool is secured for home use. The number of these in the country

is estimated at 3,000,000, and the young furnish part of the food supply of the mountaineers. Poultry is abundant in most Spanish countries, and contributes both to the table and to diversion in about equal degrees.

FOREIGN COMMERCE.

The foreign commerce of Bolivia is an unknown quantity, partly because all of it is done through ports of the Argentine Republic and Chile, and much of its value is credited in commercial statistical returns to those countries. According to the Almanach de Gotha for 1891 the total imports in 1885 amounted to $4,526,400, the exports to $7,701,390, principally of silver, and the whole trade to $12,227,790. The Statesman's Year Book for 1891 states the average value of the annual imports at $5,839,800, and of exports at $8,759,700, the average of the annual foreign trade being $14,699,500. These figures, which are probably not far from true, are liable to be considerably exceeded as to exports during irregular periods; as Bolivia exported $12,559,264 in silver in 1888, and $8,939,121 in 1889, according to the same authority, making the total exports that year $12,250,298, the most of the silver going out across the Andes, and other productions by way of Buenos Ayres. The imports and exports of 1889 through the latter route were, of the first, $102,760.95, and of exports, $3,211,177.42; total, $3,313,938.37.* The following table exhibits the foreign trade of Bolivia, as made up from the statistical official statements of the countries named by the Bureau of American Republics, in its Bulletin of May, 1891:

Commerce of Bolivia with specified countries, by principal articles.

IMPORTS.

Countries and articles.	1886.	1888.	1889.	1890.
From the United States:†	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
Iron and steel, and manufactures of	.....	7,707	1,278	2,279
Cotton, manufactures of	.....	1,373	749	3,125
Wood, manufactures of	.....	3,014	.....	15
Tobacco, and manufactures of	.....	2,369	.....	.....
Horses	.....	.....	2,100	.....
Provisions (meat and dairy products)	.....	2,036	.....	.....
All other articles	.....	5,394	2,711	5,583
Total	.....	21,893	6,838	11,002
From the United Kingdom:‡				
Iron, wrought and unwrought	61,751	250,255	.....	.....
Machinery and mill-work	56,130	64,286	.....	.....
Coal, cinders, and fuel	18,755	37,200	.....	.....
Carriages, railway, and parts of	9,548	66,929	.....	.....
Cottons	14,696	14,628	.....	.....
Bags and empty sacks	8,565	4,887	.....	.....
Hardware and cutlery	7,051	3,119	.....	.....
All other articles	84,319	98,955	.....	.....
Total	260,815	540,259	.....	.....
From France:§				
Sugar, refined	2	5,946	9,321	.....
Spirits and liquors	1,268	7,899	.....	.....
All other articles	1,348	24,627	2,274	.....
Total	2,618	38,472	11,595	.....

* Records of Argentine customs. † 1886 not stated. ‡ 1889 and 1890, none. § 1890, none.

Commerce of Bolivia with specified countries by principal articles—Continued.

EXPORTS.

Countries and articles.	1886.	1888.	1889.	1890.
Into the United States:*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
Hair			1,477	
Silver ore			28	
All other articles			621	30
Total			2,126	30
Into the United Kingdom:†				
Cubic niter	524,127	362,700		
Copper	158,969	243,072		
Guano	236,911			
All other articles	7,640	87,938		
Total	927,647	693,710		
Into France:				
Nitrate of soda	139,269	89,668	473,704	
All other articles	110		34,705	
Total	139,379	89,668	508,409	

* 1886, not stated; 1888, none. † 1889 and 1890, none.

By the preceding tables it appears that of all the imports from the United States for four years, amounting to $39,733, $2,036 represented meat and dairy products and $9,373 was of agricultural origin. Of the imports from Great Britain, none were of such origin; and from France, presumably, $24,376, if the sugar was of its manufacture and the liquor from its grain. These figures demonstrate to what a small extent Bolivia is indebted to the agriculture of other countries; an average demand for the last four years of $8,442 per year. The matter treated under the succeeding head has evidently considerable to do with this state of affairs.

COMMUNICATIONS.

From Buenos Ayres to Potosi the distance is stated by Helms* to be "1,617 geographical miles." From Potosi to Lima he states that it is "1,215 miles." It is, however, but about 250 miles to a Pacific seaport from La Paz, the capital, over the Andes by mule path. From the interior of Bolivia to the Argentine capital travel and freighting are by ox teams and by water. Now, a railway from Antofagasta, in Chile, over 350 miles long, extends to Huanchaca, in Bolivia, and will soon reach about 100 miles farther, to Potosi. This railway will afford more convenience for silver and silver ore export than for other articles, but it may help to increase all kinds of importation. Concessions have been given for other roads to connect various parts of the interior, and with the Paraguay River and the Peruvian frontier.

In the development of the agricultural and pastorial industries of Bolivia, however, its abundant water ways are most important and eco-

* Travels from Buenos Ayres, by Potosi, to Lima, etc. By Antony Zachariah Helms, etc., London, 1806.

nomical. The Paraguay and its important tributary, the Pilcomayo, are available in the southeast, and nearly a dozen tributaries of the Amazon and its large affluents in the north and east, at an expense apparently not extraordinary, according to reports of those who have ascended and descended those streams, including Helms in 1790, Gibbon in 1852, and Orton in 1867, all scientific observers.

Telegraph lines connect the capital and several of the principal cities with the Pacific coast and the Argentine system. The posts delivered over a million and a half letters in 1886, the latest given date.

MENTAL AND RELIGIOUS INSTRUCTION.

There were, in 1888, 506 primary schools, to which the Government contributed $32,310, and which were attended by 24,583 pupils, under about 700 teachers. There are four universities, besides colleges and secondary schools, with about 3,000 students. The Roman Catholic religion is that of the State, but other religions are tolerated in private.

GOVERNMENT FINANCES.

The budget for 1889–'90 estimated the receipts at $2,666,211.20 and the expenditures at $2,748,823. The foreign debt, according to an official statement in December, 1888, was $6,027,292, and the internal debt $8,736,075; total, $14,763,367. Another estimate gives the debt as over $29,000,000.* The following statement shows the sources of Government income, according to the report of 1850, as well as amount:

Items.	Income.	Items.	Income.
Duty on cinchona	$142,000	Income from minting	$200,000
Duty on cocoa	180,000	Sale of guano	20,000
Duty on sugar, liquor, etc	27,400	Impost of tenths	163,660
Duty on imports	380,000	Tax on Indians	919,000
Duty on coin exports	18,000	Various sources	20,000
Taxes in Cochabamba and Santa Cruz	15,500		
Sealed paper and patents	28,600	Total	2,123,960
Tax on precious metals purchased at Bank of Potosi	9,800		

CONCLUSION.

Bolivia is the only wholly interior country of South America lying principally in the Amazonian basin, and with portions of Brazil, Peru, Ecuador, and Colombia, it forms one of the most interesting geographical areas of the continent. The average breadth, from east to west, of the region of which it forms a most important part is 24 degress of 69.16 miles, and the average length 19 degrees. Consequently over 2,000,000 square miles, in one body, of a wonderfully fertile and almost spontaneously productive country is there awaiting the attention of commerce

* Statesman's Year Book, 1891.

and a suitable population. The navigation of the Amazon is free, and with its tributaries, drawn from the countries mentioned above, it furnishes over 10,000 miles of water navigable by large ships, and indefinitely more for smaller craft. The outlet to this great, rich, and undeveloped area, the mouth of the Amazon, is only about 3,100 miles from New York, and nearly the same from New Orleans. It is, therefore, about equally accessible for intercourse with all the United States east of the Rocky Mountains.

BRAZIL.

Brazil, the latest nation to join the column of American Republics, the largest except the United States, extends from 5° N. to 33° 41′ S., and from about 36° to 73° W. from Greenwich, according to the railway map of the International American Conference, having a length north and south of about 2,675 miles and a breadth along the seventh degree of south latitude of about 2,500 miles, the widest part. It is worth notice that the longitude of New York City and that of the extreme western part of Brazil are nearly identical, so that Brazil lies almost wholly east of the United States; and also that the distance between the latitude of the extreme southern limit of this country, in Florida, and that of the extreme northern limit of Brazil, is only 20 degrees, or say 1,400 geographical miles, less than the distance from New York City to Little Rock, Ark.

The boundaries of Brazil make her outlines very much like those of South America itself, and every political division of that continental area, except Chili, contributes to their formation. Venezuela and the three Guianas lie on the north, while the Atlantic Ocean forms the boundary on the northeast, east, and southeast; then Uruguay, the Argentine Republic, and Paraguay mark the southern and a part of the western limits, which latter are extended by Bolivia, Peru, Ecuador, and Colombia to the boarder of Venezuela. An extension of the extreme westward limit to a distance of 400 miles, across the Andes, would take Brazil to the Pacific Ocean at Callao, Peru. The country now includes more by over half a million square miles than half of South America. It is divided into 20 provinces answering to our States in some respects; and the area and population of these provinces are given in a statistical publication prepared by Mr. J. P. Favella Nunes for 1888, and printed by order of the Brazilian Government in 1889, respectively, as follows:

Table showing the area and estimated population of Brazil by provinces in 1888.

Provinces.	Area.	Population.	Provinces.	Area.	Population.
	Sq. miles.			*Sq. miles.*	
Amazonas	732,439	80,654	Municipio Neutro	538	406,958
Pará	443,904	407,350	Rio de Janeiro	26,634	1,164,438
Maranhão	177,561	488,443	São Paulo	112,307	1,306,272
Piauhy	116,524	266,933	Paraná	85,451	187,548
Ceará	40,251	952,625	Santa Catharina	28,632	236,346
Rio Grande do Norte	22,195	308,852	Rio Grande do Sul	91,333	64,527
Parahyba	28,854	496,618	Minas Geraes	221,952	3,018,807
Pernambuco	49,573	1,110,831	Goyas	288,537	211,721
Alagoas	22,583	459,371	Matto Grosso	532,683	79,750
Sergipe	15,093	232,640			
Bahia	164,644	1,821,089	Total	3,219,000	14,002,3 5
Espirito Santo	17,312	121,562			

MAP OF SOUTH AMERICA,

showing national boundaries, and particularly state boundaries and railroad lines of Brazil.

This estimate of population is based upon the normal decrease and increase of the census number, ascertained in 1872 to be 9,930,478, of which 1,510,806 were slaves, showing a probable increase in the total population in sixteen years of 4,056,805. An official return of June 30, 1885, showed the slave population to be then 1,133,228, and another of 1886 showed that since 1871 24,165 slaves had been freed by the emancipation fund. Others were freed at 20 and 60 years of age.

In the census of 1872 the population was found to be divided by race characters as follows: Caucasians, mostly of Portuguese descent, 3,787,289; negroes, 1,959,452; Indians (*raça americana*), 386,955; and mulattoes and mestizos, the latter being of mixed Indian and negro blood, 3,801,782; total, 9,930,478. Over 61.9 per cent of the population, therefore, belonged to the colored races and their mixtures. A like proportion of the estimated population of 1888 would show 5,334,890 Caucasians and 8,667,445 of the colored and mixed races in Brazil. The Indians and mestizos are said by Agassiz and others to inhabit mostly the valley of the Amazon, while it is apparent that the negroes and mulattoes are mainly distributed among the people of Caucasian descent, and hence are to be found in cities and towns and among the plantations, where the most of the negroes have been owned. These facts have their relation to the present and prospective demands of the country upon the productions entering into its foreign commerce.

On the 15th of November, 1889, a nearly peaceful revolution overthrew the empire and banished the royal family, and under the provisional government, on June 22, 1890, the Constitution of the United States of Brazil was promulgated, definitely organizing the republic and defining the duties and rights of the government and people. African slavery, which had prevailed from about the beginning of colonization of the several provinces or captaincies, was in process of extinction by legal limitations, purchase, and voluntary manumission, under the humane and enlightened Emperor Dom Pedro II, and it was finally wholly abolished, and about 732,000 slaves emancipated by a law signed May 13, 1888, by the crown princess, regent during the absence of Dom Pedro in Europe. The value of the slaves thus freed was estimated at over $485,000,000, but compensation to owners was refused consideration by the legislature. The slavery question, therefore, was effectually disposed of before the new republic was established.

CONSTITUTIONAL PROVISIONS.

Those constitutional provisions of most interest in view of the objects of this article may be summarized as follows: Brazil is constituted a federal republic, with the title of United States of Brazil, of which each of the former provinces is constituted a state and the former municipal district a federal district, including the national capital. The organization of the different branches of government is nearly like that in this country, the principle being the same. Legislative powers be-

long to the national Congress, but acts are subject to approval by the President of the Republic. Congress is composed of a senate and chamber of deputies, members of the former, consisting of three for each state, being chosen for nine years, and of the latter, at the rate of one for every 70,000 inhabitants, for three years.

The executive authority is exercised by the President, whose term is six years, who must be a native of Brazil, over 35 years of age, and who is ineligible to a succeeding term. Both President and Vice-President are chosen by an electoral college, the members of which are elected by the several states and the federal district in proportion to twice the number of their representatives in Congress; but in case of failure to select by this method, by a majority of all the votes, election devolves upon Congress in joint session, each state and the federal district casting a single vote, and electing by majority vote from the highest three candidates shown in the record of votes of the electoral college. The Vice-President succeeds the President in any case of vacancy not provided for as above, and is ineligible to succeed himself after three years service as President.

The President selects and dismisses his cabinent officers, but nominates diplomatic officers for the approval of Congress. His ministers can not appear before Congress, nor can anyone hold two offices.

The judiciary branch of the Government is in its organization and scope similar to the Federal judiciary of the United States, but the judges are appointed by the President of the Republic, for life.

The federal constitution confers the suffrage upon citizens 21 years of age, except beggars, those who can not read, soldiers in service, and members of orders owing first allegiance to a foreign power, as the monastic orders do; it institutes civil marriage, secularizes the cemeteries, secures freedom of worship, and provides for free primary education and for higher schools in aid of the states. It reserves to the national Government the power to levy duties on imports and on shipping, the establishment of customs-houses, banks of emission, and the control of postal and telegraphic communication. It prohibits the Government from favoring the ports of any state against those of any other by commercial or fiscal regulations. To the states, however, is delegated the power to levy taxes on merchandise not belonging to other states, on landed property and on the transmission of property, and on imports of foreign goods intended for consumption within the state, which duties are to be covered into the federal treasury; but no state can impose duties on imports in transit. All duties on exports are to cease after 1895. A constituent assembly, which met at Rio de Janeiro on November 15, 1890, by legal provision elected Marshal Manoel Deodero da Fonseca to the Presidency of the Republic until the election contemplated in the constitution could be held.

PHYSICAL CHARACTERISTICS.

Although nearly the whole of Brazil lies within the tropics and a part of it across the equator, which is on a line with the mouth of the Amazon, the climate in most parts, away from the seashore and its lowlands, is rather remarkable for its salubrity. This arises from physical features which give elevation above sea level and secure for about two-thirds of the country, or at least more than half of it, ample drainage. Count Amelot de Chaillou, minister of France to Brazil, whose report upon the agriculture of the country to the French ministry of agriculture, published in 1889, is confirmed in various of its features by the writings of Agassiz, ex-Consul-General Andrews, Consul-General Dockery, and several consuls of the United States in Brazil, gives in considerable detail the leading physical features of that country, and the principal part of his description is herein transcribed for a better understanding, with map consultation, of the basis and possible extent of Brazilian agriculture, which, with that of the Argentine Republic, has very important relations to that of our own country:

The largest portion of Brazil is a plateau, from 300 to 1,000 meters* in altitude, which is bounded on the north and west by the great depressions of the Amazon and the Paraguay, which are nearly united by the valleys of the Madeira (one of the largest affluents of the Amazon) and its tributary, the Guaporé. The country also includes a part of the plateau of Guiana, nearly half of the basins of the Amazon and the upper Paraguay. To these four large divisions the maritime region, occupying a narrow strip lying between the Atlantic and the eastern border of the great Brazilian plateau, must be added.

This plateau consists of a series of heights which sharply intersect the valleys of the many rivers. It is subdivided into four secondary plateaux, which occupy the basins of four rivers, viz, the Paraná, the Amazon, the São Francisco, and the Parnahyba.

The plateau of the basin of the Paraná comprises the largest part of the provinces of Rio Grande do Sul, Santa Catharina, São Paulo, and parts of Minas Geraes and Goyas. The high portions of Matto Grosso lie between the Paraguay and the Paraná. The maximum height of the eastern boundary of this plateau in Paraná and São Paulo is about 1,000 meters, but towards the south and west there is a decline of several hundred meters.

The plateau of the Amazon occupies the larger part of the provinces of Matto Grosso and Goyas, a part of the south of the provinces of Amazon and Pará, and of the west of the province of Maranhão. Its southern border presents an escarpment 800 to 1,000 meters high to the opposite depression of the Paraguay River.

The plateau of São Francisco extends west of this river into the western parts of Minas Geraes and Bahia, and averages 800 meters in height above sea level.

The plateau of Parnahyba comprises nearly all the province of Piauhy and parts of the provinces of Maranhão and Ceará, and probably bounds the Amazonian plateau.

The true mountains lie towards the east and center and form two principal systems, which are separated by the plateau of São Francisco and Paraná, the central and maritime. The first occupies the southern part of the province of Goyas and a part of that of Minas Geraes, and is united with the second by a transverse chain, the Serra das Vertentes, in the last-named province. This latter chain forms at various points the line of separation of the waters of the eastern part of the continent. The

* One meter=3.281 feet.

maritime system is long and comparatively narrow and divides into two well-defined chains in the provinces of Espirito Santo, Rio de Janeiro, São Paulo, and Paraná—the Serra Mantiquiera and Serra do Mar, which, as the name indicates, runs along the coast. It is to these branches that the Organ and Tijuca ridges belong, which give such a magnificent surrounding to the bay and city of Rio de Janeiro, although their altitude is not great. * * *

The grand Amazonian Valley is proportionally narrow in its upper part, but broadens considerably upon the confluence of the Rio Negro with the main stream. In general the Amazon is bordered by low alluvial plains, which are interspersed with lakes and intersected by an infinite number of natural canals. The highest lands of this valley do not exceed an altitude of 300 meters. The extensive plains which form the basin of this river and a large part of the Argentine Republic, of Paraguay, and eastern Bolivia, begin in that part of the Paraguayan depression which belongs to Brazil. These plains are several hundred meters below the general level of the surrounding plateaux and are scarcely higher than the water of the river and its affluents, and are easily transformed into vast lakes and swamps during the rainy season.

Botanically Brazil is divided into three principal regions: The equatorial belt, the coast belt, and that of the interior (sertão). This last is again divided into two sections, the northern, or tropical, and the southern, or subtropical, which is the smallest.

The equatorial belt is covered with an immense virgin forest, which covers the basin of the Amazon for a mean length of 9° (2° N. to 7° S.). The climate of this region is always warm and moist and develops an extraordinary vegetative vigor and abundance; and, as there is but one season, each month one sees flowers blooming and fruit maturing. * * *

From the Pará River the equatorial forest extends south to the mouth of the São Francisco as a mighty barrier. At this point, between the coast and the Serra do Mar, begins a primitive tropical forest which extends to the Rio de Janeiro and the thirteenth degree south, and penetrates quite deeply into the interior. More varied because of the broken character of the soil, it is almost impenetrable. * * * Besides a great variety of palms which it possesses in common with the equatorial forests, it contains an abundance of precious woods, among which the violet-ebony is found.

The interior does not offer a like magnificence of vegetation with the two preceding zones. The tropical forests appear only in the valleys, and in damp low spots. Indeed, its existence is impossible elsewhere, because of the strong contrast which the dry season makes to the wet. The vegetation of this part of Brazil is characteristic of the campos (plains). This term is applied to large extents of land covered with graminiverous plants, and distinguished from the Argentine pampas by their undulating form.

Their monotony is often broken by clumps and larger collections of various shrubby trees on the high grounds, and larger growths along the water courses and in the valleys.

In the dry season the campos are scorched by the sun, the trees become leafless, and one would call them dead; * * * but with the first rain the leaves shoot out as if by magic, and the campos are speedily covered with green.

This rather extended description, necessary to an intelligent consideration of the character of Brazil, relative to the character and extent of its present and possible agricultural productions, is sufficiently summarized by ex-Consul-General C. C. Andrews, in his thoughtful book on "Brazil: Its Condition and Prospects," published in 1887.* He says:

First, there are the hot lowlands, bordering the ocean; secondly, the highlands, partly prairie, and on the average 3,000 feet above the sea level, with a salubrious

*Another edition is recently issued.

climate; and thirdly, the great forest-clad river basin. The vast basin of the Amazon, which occupies the northern part of the empire, and comprises a third of its whole area, is nearly level, although there are occasional bluffs and not very high mountain spurs on its shores as well as along the banks of its tributaries. This region is mostly covered with forests. The other two-thirds of the country are to a great extent mountains, or at least much elevated and broken. Distinct ranges of mountains extend along nearly the whole of the seacoast, but they generally are only about 4,000 feet high, are covered with a good growth of hardwood trees, and always have a green appearance. * * * In the central and southern portions of Brazil are extensive undulating plains, mostly devoid of timber, covered with green grass in summer but shriveled and almost bare in winter,* and which, though better suited for cattle-raising than for field culture, occasionally suffer long-continued and fatal droughts.

For a further understanding of the matter, so far as it was investigated or reported upon in this respect by Prof. Louis Agassiz in 1865, the following is extracted from the interesting volume, which was one result of his travels, "A Journey in Brazil," edited and partly written by Mrs. Agassiz. He says of the Amazonian system:

It must be remembered that the valley of the Amazons is not a valley in the ordinary sense, bordered by walls or banks inclosing the waters which flow between. It is, on the contrary, a plain some 700 or 800 miles wide, and between 2,000 and 3,000 miles long, with a slope so slight that it hardly averages more than 1 foot in 10 miles. Between Obydos and the seashore, a distance of about 800 miles, the fall is only 45 feet; between Tabatingo and the seashore, a distance of more than 2,000 miles in a straight line, the fall is about 200 feet.

It appears from the foregoing testimony of most intelligent observers that by situation and topographical features almost the whole of Brazil, an area nearly as large as that of the United States exclusive of Alaska, is more or less suited to various productions of agriculture, grazing, and forestry. The inland plains are extensive, and the mountain elevations suited to coffee plantations, and these are two-thirds of the extent of the country, nearly; while the Amazon Basin is easily accessible in almost its whole extent through the great river and its affluents, and yields various woods, gums, resins, oils, nuts, medicinal and fiber plants in inexhaustible abundance, and is capable of supplying the world with certain fruits, etc. But as soil and climate are modifying factors, they are also to be considered relative to the portion of the country not included in the Amazon Basin in Brazil, which last, because of its annual inundation and general overflow, is excluded from consideration in this connection. The remoter portions are considered in their several connections with other countries.

GENERAL CHARACTER OF THE SOIL.

Prof. Agassiz made a special study of the accessible deposits underlying the alluvium of the Amazon, of those in the province of Ceará, and about Rio de Janeiro, and came to a clearly expressed conclusion

* Winter in Brazil and south of the equator corresponds to our summer, and *vice versa.*

that under such alluvium, generally in the valleys and upon the surface over a large portion of the higher land, especially on the mountains, the soil is usually composed of glacial drift. The composition of this drift he found to be principally a red to purple sandy clay, with rounded quartz pebbles mixed in, and generally underlying it in something like a semidistinct stratum. He found this drift in the north bank of the Amazon and about Rio, and in moraines in the Serra of Aratanha, in Ceará, filled with bowlders and sometimes revealing distinctly the different character of the underlying rock, where it cropped out or was denuded.

As to the value of this prevalent soil Mr. Andrews states:

Whatever may have been the origin of the soil—call it "drift" or "deposit" as we may—one thing is certain, that nearly over all the surface of Brazil the soil has a red color; and the darker the shade of red which it has, and the nearer it approaches to a purple color, the more fertile it is found to be. Such soil frequently occurs on the more elevated situations, where it produces a rich growth of vegetation, and indeed, is found on mountains more frequently than on low land.

But that this prevalent surface soil is not in sufficient quantity, or on the other hand rich enough in plant food at a cultivable depth to secure uniform fertility, there is sufficient positive evidence. And in addition there are intense climatic influences to be considered. Mr. Andrews further states:

The more fertile tracts of the country [in the interior] are like islands in a great area of thin soil. One may sometimes travel for days on horseback over poor and almost worthless land. A naturalist who has spent several years traveling in Brazil said to me: "Brazil is not a fertile country; even the rich vegetation in the Amazon Valley is not owing to fertile soil, but to the air and rain." Speaking of the large province of Matto Grosso, comprising almost a fourth of the empire, he said: "It is a splendid desert." Having traveled hundreds of miles in different directions in some of the most fertile and productive parts of the country, I must say that its vegetation is not more remarkably luxuriant than what would be met with in some parts of the United States or Europe.

Mr. Walter J. Hammond, a British railway manager in Brazil, is quoted by Mr. Andrews as giving "a fair summary of the character of the land," as follows:

The chief reason for the belief in the surpassing fertility of the land is not based on what it has been known to give per acre, but rather it is the result of an ocular impression of the glorious green mountains that form the coast line of the southern half of Brazil. Instinctively, all attribute fertility to forest lands, and to a certain extent this is right, owing to the magnificent alluvial deposits found in them, often the accumulation of many a century. But Brazil is not all covered with dense forests, and even where it is, and where the soil is sufficiently moist and good, the land is not by any means suitable for any other than tropical agriculture.

There are myriads of miles of sterile campo land, on which only rank grass grows, and there are miles untold of sandy plains, on which only scrub cork trees and other similar growths will flourish. * * * Examining the province of São Paulo, notably one of the richest in Brazil, a territory not much inferior in size to England, Scotland, and Ireland combined, we find that down the coast for a distance of from 50 to 80 miles inland the land is comparatively useless from an agricultural point of view. Beyond this strip of land the soil is a little better, and will, after the forest has been

cut or burned down, produce one or two crops of Indian corn or rice without the need of manuring, after which it is used up. About 100 miles from the seacoast commences the coffee district, which is also variable in fertility, some parts being very good, others useless from being too dry, and others too sandy. Two hundred miles inland, in the region between the rivers Pardo, Piracicaba, and Tieté, where trap rock is chiefly found, is the famous red land. Even here there are stretches of miles and miles of sandy campo land, useless for anything. * * *

Again, there are certainly good grazing lands in the west of São Paulo and in Minas Geraes, hundreds of miles from the markets, but they can not compare with the prairies of the Rio Grande and the Argentine Republic. * * * Brazil's chief riches are her tropical products and her unworked minerals. * * * To sum up this question of "surprising fertility," Brazil is very like the United States in being rich and poor as far as her soil goes, but she can not compete with the States in many things, owing to her physical configuration, her rivers in the southern half of the Empire being of little use, having short stretches of navigable water, and being cut up by innumerable rapids and waterfalls; finally, they chiefly run toward Bolivia and her other western frontiers instead of toward the coast.

It would, perhaps, be unfair to omit a statement having the sanction, presumably, of the Brazilian Government relative to its agriculture, which presents a more cheerful view, and which is contained in the "Agricultural instructions for those who may emigrate to Brazil, by Dr. Nicolau Joaquim Moreira," published in 1875. After dwelling upon the acknowledged richness of the arboreal vegetation, the general salubrity of the climate, the large yield of coffee, cotton, sugar cane, and corn per acre, as compared with the yield of some of these in the United States, Dr. Moreira says:

Brazil possesses a sufficiency of natural elements to raise it to the rank of a first-rate agricultural nation; but the vastness of its territory, its sparse population, the want of capital, which is absorbed by commerce, the absence of professional knowledge, the immobility of large sums employed in immense tracts of uncultivated land, and the difficulty of communication have retarded the progressive evolution of these elements. * * * All the products of Europe, Asia, and Africa thrive on this blessed soil as in their native land.

CLIMATIC INFLUENCES UPON AGRICULTURE.

To arrive at a reasonable conclusion as to the status of Brazil as an agricultural country, or the possibilities of its development in that direction, climatic conditions and influences must be considered as well as topographical features and the character of the soil. Here, as before, the Brazilian basin of the Amazon need not be considered, as it is certain that much and probable that most of it will never be cultivable, for obvious reasons, except for coffee in some parts.

As to the temperature Mr. O. H. Dockery, consul-general of the United States at Rio de Janeiro, states in a dispatch to the Department of State as follows:

The mean temperature in the country between Rio de Janeiro and the Amazon is 78.8° above zero;* that of the Amazon is 80.6°. In no part of Brazil is it hardly

*As written, "26° centigrade above zero;" but herein centigrade is changed to Fahrenheit.

ever higher than 96.8°. * * * It is stated that an elevation of 700 feet makes a difference of a little over 1° C. in the temperature" (*i. e.*, about 2° F.). Of course these are mean temperatures in the shade.

In the report of the French minister, Count de Chaillou, previously quoted from, he says, relative to temperature:

At the city of Rio de Janeiro, which is situated on the boundary line of the torrid and temperate zones, the average temperature, according to the Annuario do Imperial Observatorio for 1887, is 74.1° F.,* according to thirty-six years of observation. Only two seasons are known here, summer, or the rainy season, which lasts from October to the end of March, and winter, or the dry season, which lasts from April to September. The average temperature of summer is about 78.8° and that of winter 69.8°. The highest temperature noted was 99.5° and the lowest 50.3°, which is about the average temperature of Paris. The difference in the winter and summer temperature is, therefore, very slight in reality, but the long continuance of the heat and the warm nights make the heat keenly felt. The humidity is very great, about double that of Paris. * * *

As a whole the climate of the coast is like that of Rio de Janeiro. It is especially hot and moist in the northern provinces. As one nears the equator the heat increases, but not in a notable degree. At Bahia the average summer temperature is 82.4° and that of winter 71.6°; at Pernambuco 79.5° and 76.8°, respectively. * * * At all these points the heat is tempered by regular breezes.

Mr. Andrews states that the average annual temperature of Pará is 80°.

The interior is divided into two climatological parts. The first, situated in the north, includes the whole plain of the Amazon, with its warm, humid climate. It knows but one season, and there is very little difference in the warmth of day and night. The thermometer rarely descends below 77°, and only occasionally exceeds 86°. The rainy season of the interior commences in November and lasts until February or March.

The second division of the interior possesses the characteristics of a continental climate, and there is a more marked difference in the seasons; but these circumstances vary, and are modified by the local configuration of the land. The mean temperature diminishes from the north to the south, but not rapidly. Very high in the province of Goyas, and the interior of Ceará, it is temperate in the valley of the San Francisco. In the southern part of the province of Minas Geraes it is very hot in summer and very cold in winter, and the thermometer sometimes reaches below zero. In the province of São Paulo the difference between summer and winter is less marked; the heat there is most intense in the former season. The provinces of Paraná and Rio Grande do Sul enjoy a temperature which forms a transition from the hot to the temperate. Only two seasons are known in the interior, the wet and the dry. In the former rain is abundant, indeed almost continuous. Sometimes, also, it rains in the dry seasons, local conditions having great effect upon climatic conditions.

Few observations of temperature, rainfall, or humidity, except in the coast cities, seem to have been made in or published for Brazil; and even those of the coast cities have in few instances extended over a long series of years. The following table of temperature and rainfall along the coast is taken from a publication prepared by the Government of Brazil for the Paris Exposition. The points of observation extend from 100 miles south of the equator to almost the southern limit

* Reduced from centigrade in each instance.

of the country and the observations themselves over periods of from one year to thirty-five years.

Stations.	Latitude south.	Altitude.	Temperature.			Annual rainfall.
			Mean annual.	Maximum.	Minimum.	
	° ′	*Feet.*	° *F.*	° *F.*	° *F.*	*Inches.*
Maranhão, Maranhão	1. 27	142	81. 32	92. 84	69. 98	96. 65
Fortaleza, Ceará	3. 44	.....	79. 88	.....	.....	59. 06
Quixeramobim, Ceará	5. 16	.....	84. 74	92. 48	76. 64	.....
Amarante, Paranhyba	6. 13	.....	80. 78	95. 90	64. 40	6. 30
Recife, Pernambuco	8. 04	10	79. 16	99. 14	61. 34	.....
Colonia da Victoria, Pernambuco	8. 09	528	77. 18	102. 20	52. 88	.....
Colonia Isabel, Pernambuco	8. 45	751	74. 66	95. 90	52. 70	.....
São Bento das Lages, Bahia	12. 37	98	76. 64	95. 00	.....	80. 83
Bahia, Bahia	12. 58	210	78. 80	88. 70	35. 78	85. 16
Queluz de Minas, Espirito Santo	20. 40	.....	67. 82	90. 32	33. 80	57. 52
Ribeirão Preto, Espirito Santo	21. 10	1, 706	68. 00	93. 20	32. 00	23. 62
Cascata, Rio de Janeiro	21. 53	4, 167	64. 40	104. 00	32. 00	51. 18
Nova-Friburgo, Rio de Janeiro	22. 19	2, 874	62. 96	84. 20	33. 80	51. 73
Rio de Janeiro, Rio de Janeiro	22. 54	217	74. 30	99. 50	50. 36	44. 33
Santa Cruz, Rio de Janeiro	22. 56	85	71. 96	97. 88	66. 56	184. 33
São Paulo, São Paulo	23. 33	2, 395	62. 24	91. 58	30. 38	59. 06
Coritiva, São Paulo	25. 27	2, 953	64. 22	100. 40	24. 08	.....
Colonia Nova-Petropolis, São Paulo	26. 48	.....	66. 38	.....	42. 62	.....
Colonia Blumenau, Paraná	26. 55	.....	70. 52	.....	.....	60. 71
S. Antonio-da-Palmeira, Paraná	27. 54	1, 896	64. 40	93. 20	30. 20	.....
Passo-Fundo, Santa Catharina	28. 28	2, 060	62. 78	93. 92	32. 00	.....
Taquara, Rio Grande do Sul	29. 40	.....	65. 66	.....	.....	.....
Santa Cruz, Rio Grande do Sul	29. 45	.....	66. 56	95. 00	.....	.....
Pelotas, Rio Grande do Sul	31. 46	6, 152	62. 96	99. 50	31. 10	41. 97
Rio Grande do Sul	32. 00	52	65. 84	90. 32	33. 80	35. 91

The following table contains the principal data as to the rainfall in the interior of Brazil and is compiled from the same source of information as the preceding table. From the table and note it appears that the places west of the coast mountains generally have a far less annual rainfall than Congo-Soco, the place of greatest elevation, and Cubitão, which is nearest the coast and has also considerable elevation. The slight amount of precipitation in the winter (the summer of the northern hemisphere) should be particularly noted relative to the westward facing locations, the average for the four points given being but nine-tenths of an inch for the three months.

Rainfall at certain points in the interior of Brazil, with given geographical positions and elevation above sea level.

[Arranged from statements in "Brazil in 1889," published by authority of Government.]

	Latitude south.	Longitude west from Greenwich.	Altitude.	Years of observation.
	° ′	° ′	*Feet.*	
Valley of the Upper Paranhyba	6 0	43 30	303	1
Sabará	19 47	44 19	2, 280	25
Congo-Soco	19 58	43 33	3, 576	2
Itabira do Campo	20 15	43 55	2, 733	1
Queluz	20 40	44 17	3, 223	2
Casa Branca	21 47	49 30	*2, 500	.....
Height of Cubitão	23 45	46 30	2, 625	15

* Estimated.

Rainfall at certain points in the interior of Brazil, etc.—Continued.

SEASONS.

	Summer (winter).	Autumn (spring).	Winter (summer).	Spring (autumn).	Total for the year.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Valley of the Upper Paranhyba	16.1	46.6	0.0	7.3	38.0
Sarbará	35.8	11.0	1.5	16.1	64.4
Congo-Soco	59.6	18.6	4.3	32.9	115.4
Itaibra do Campo	28.9	8.8	0.0	13.6	51.3
Queluz	37.2	6.1	. 2.1	11.8	57.2
Casa Branca					39.4
Height of Cubitão	50.4	37.7	24.4	28.3	140.8

NOTE.—The valley of the upper Paranhyba is about 500 miles from the sea, map measurement; Sabará is about 250 miles inland, on the west side of the mountains; Congo-Soco is 150 miles back, in the mountains; Itabira do Campo is about 60 miles inland, and Queluz 200, both in the mountainous interior west of the coast range; the height of Cubitão is not far from Rio de Janeiro, and Casa Branca is not far from 150 miles from the sea, in the state of São Paulo.

Relative to the temperature and rainfall in the interior generally reference must be to descriptive statements in the absence of statistical ones. Of the interior of the tropical state of Ceará Agassiz says:

The sertão (desert) is beautifully green now, * * * but in the dry season it justifies its name and becomes a very desert indeed, being so parched that all vegetation is destroyed. The drought is so great during eight months of the year that the country people living in the sertão are often in danger of famine from the drying up of all the crops. After this long dry season the rains often set in with terrible violence. * * * It rains day and night for weeks at a time.

During the dry season cattle subsist almost entirely upon a single species of shrub allied to our hawthorn, but for which they would perish. These remarks also characterize the interior of the contiguous states; but the seasonal conditions seem scarcely to vary from these in the subtropical states of Alagoas, Sergipe, etc. Says "Brazil in 1889," in an article on climate made under the supervision of the Imperial Observatory of Rio de Janeiro:

During all the dry season the prairies, which serve as pasturage for the immense herds of cattle which are to-day one of the chief sources of provincial wealth, are completely dried and burned up by the sun. The live stock, whose weak and lean condition renders them pitiful objects, retire into wooded districts and subsist as best as they may upon half-dried leaves till the return of the rainy season. Vast tracts which then seemed calcined and sterile are in a few weeks covered with a luxuriant vegetation, and in a short time the cattle become fat and vigorous. But unfortunately it quite frequently happens that the rainy season, instead of following the dry does not come for a whole year or several years. Famine with its cortège of horrors settles down upon the unhappy province. The stock dies in masses, communication is interrupted, and immense numbers of fugitives make their way towards the coast, and the road is marked by the bodies of those which have died of misery, hunger, and thirst.

The first drought of which mention is made in history occurred in 1710–'11; then followed those of 1723 to 1727, 1734–1836, 1744–'45, 1777–'78, and particularly that of 1790 to 1793. It appears that 1792 passed without the fall of a drop of water. The mortality was frightful. The captain-general of Pernambuco informed the crown of Portugal that more than a third of the population had succumbed to it. This scourge continues and has continued during the present century with a certain regularity, the most severe droughts having taken place in 1803–'09, 1816–'17, 1824–'25, 1844–'45, and latterly from 1877 to 1879. The periods of drought in this century correspond nearly

to those of the past. At this time, December, 1888, the season is excessively dry, and the suffering is already great. Perhaps it may be the beginning of as disastrous a drought as that from 1790 to 1793.

The subtropical region may be divided with relation to its rainfall into two distinct parts. The first includes Alagoas, Sergipe, the cost of Bahia, and we will add Pernambuco. That part receives a rainfall every year, but the largest quantity occurs in June, July, and August. * * * The southern part of Bahia, the provinces of Espirito Santo, Rio de Janeiro, a part of the coast of São Paulo, and the eastern part of Minas Geraes constitute the remainder of the subtropical zone. This subdivision is characterized by a predominance of rain, especially during the autumn and the summer; that is, from December to April.

On the Caldas Sierra, 4,166 feet above the sea, between the provinces of Minas Geraes and São Paulo, at Cascata, latitude 21° 53′, in 1884 a temperature of 104° was observed in January, and of 32° in June. The variation was enormous in reference to the latitude, and was due to the distance from the sea. The average temperature is nearly 65.4°, and coincides with that of April.

The annual rainfall is 59 inches. All the neighboring region has the same climate. At Ribeirão-Preto, 21° 10′ latitude, and over 300 miles west of Rio de Janeiro, at an altitude of 1,622 feet above the sea, the average temperature is 68°, and it sometimes freezes during June and July. The city of São Paulo, in the province of that name, is situated on the plateau on the inner side of the Serra do Mar, at an altitude of 2,645 feet. The exterior declivities are very rainy, because of the position of the mountain chain and the direction of the sea winds. The amount of the annual rainfall at Alto de Serra [the near mountain height] is 140.6 inches, and at Cubatão below, 142 inches; while at São Paulo, which is on the other side of the mountains, and to which the winds come half dry, the rainfall is, according to M. Joyner, 59 inches. According to the same observer the mean temperature oscillates about 62.6°; absolute maximum, 91.6°, and for the least it often freezes in June and July. The climate of São Paulo, with that of the high plateau of that province, and of Rio and Minas Geraes, is a sort of transition between that of the subtropical zone and that of the mild temperate. In consequence of the altitude the temperature falls considerably, and in this the climate differs from the subtropical, but they agree in the periodicity of the rainfall.

The south of the province of São Paulo, the provinces of Paraná, Santa Catharina, and Rio Grande do Sul constitute the third large division of Brazil. The temperature is very mild here, the average being below 68°, and the climate one of the finest in the world. The cold, which is quite severe in July, is conducive to the health of Europeans, * * * and these provinces have been almost exclusively chosen by European immigrants. The rainy season is unlike that of other regions of the empire. In proportion as one leaves the equator the change from the dry to the wet season becomes less marked, while the breadth of variation in the temperature during the different months increases constantly.

On the high plateau at Lages, 27° 43′ S. latitude, and 3,238 feet above the sea, the rains fall in winter. Dr. Lallemant describes a snowstorm here which occurred from the 26th to the 30th of July, 1858, which destroyed over 30,000 head of cattle, and says that on crossing the Serra do Mar into Paraná, in August, it stormed every day or night.

Again quoting from "Brazil in 1889:"

At Coratiba, latitude 25° 27′ S. and about 3,000 feet elevation, and on the high Paraná plateaux it frequently snows during the winter. * * * At Palmeira, 27° 45′ south, and 1,900 feet above the sea, from 2 to nearly 2⅓ inches of snow fell in August, 1879; at Passo Fundo (28° 28′) there were about 4 inches, and at Vaccaria the enormous quantity of 31½ inches. So in the night of August 9, 1885, snow fell to the depth of 2¾ inches in the city of Rio Grande do Sul; at Bagé, 4¾, and Cassimbinhas, over 8½ (8.66 inches). Hail falls frequently, especially in summer.

One more piece of testimony relative to the influences of the climate on production may fitly close this general and not too satisfactory aspect of the case, except a special comparative exhibit, with tables, further on. The following is taken from a book before quoted, "Brazil, its Condition and Prospects," by ex-Consul-General Andrews:

Senator Henrique d'Avila, a rich stock-raiser in the province of Rio Grande do Sul (the most southerly part of Brazil), also ex-minister of the department of agriculture and public works, imparted some valuable information in regard to recent changes of climate and droughts in that province, in a speech which he made in the Senate on the 13th of July, 1884. Senator Martins had stated that Rio Grande do Sul had not been scourged by droughts like the province of Ceará, and in reply to this M. d'Avila affirmed that his province had suffered such formidable droughts as to cause poverty and ruin to many of the inhabitants. They had had, he said, a drought lasting three years, by which many stock-raisers lost almost all their cattle, and both in Rio Grande and the adjoining State of Uruguay there had been farms in the interior districts without one single head of cattle. The cattle had died or fled for water, so that nearly all were lost.

In regard to wheat culture, it was not abandoned, as had been alleged, because cattle-raising was more lucrative, but in consequence of the irregularity of the climate and damage by rust. Formerly in Rio Grande the winter weather was uniformly cold, with occasional ice; rain came in its proper season, and the summers were always warm, with more or less intensity, according to the month. Wheat, after it had germinated and well put forth, required frost, and did not prosper without it. This province had changed so much in its seasons that in the mouth of December (middle of summer), they had strong frosts, with ice, as in winter, and in July and August they had such heat as to cause premature germination of seed. In consequence of such irregularity in the seasons as had occurred for several years in the province of Rio Grande, the planters of wheat began to despond, seeing that they could no longer harvest the crops of former times, and which, indeed, had been the foundation of their wealth. There are many fortunes to-day whose foundation had been the production of wheat in previous good times. Consequently, Rio Grande do Sul was in perfectly the same condition as the province of Ceará.

Without doubt, continued Senator d'Avila, Rio Grande do Sul has magnificent forests in her mountains; so has Ceará mountain riches that are never touched by drought, which constantly have water, water permanently, but the mountains can not save the valleys of Ceará. Rio Grande do Sul has fine forests in her mountains, but none in the valley, which comprises the south part of the province.

Senator MARTINS. But it has water.

Senator d'AVILA. Our rivers dry up. The Santa Maria, when I was at Uruguayana (southwestern frontier of Brazil) and crossed it, was completely dry. The drought was such that we had no water to give to the animals we took, and some of which perished for want of water. I believe the Government ought to cause studies to be made, as it did in Ceará, for irrigating different provinces, such as Rio Grande do Sul, the interior of Bahia and Pernambuco, and the region of the upper São Francisco Valley.

Sustaining and extending the foregoing statement, our present consul general to Rio de Janeiro writes to the Department of State, under date of September 2, 1890:

In the country between the Amazon and Paranhyba rivers rains are abundant. Then follows a vast territory, extending to the São Francisco River, subject to long droughts. These are most intense in the State of Ceará and the territory immediately adjoining it. South of the São Francisco River the rainfall is usually suffi-

cient, except in localities denuded of the forests that originally covered the soil. On the coast of Brazil, taken as a whole, the yearly rainfall is said to average 78 inches, though it varies greatly in different years and different localities. In the interior it is much drier than on the coast.

So far the testimony relating to meteorological conditions prevailing through the principal portions of Brazil, whether statistical or descriptive, by Government publications or the writing of intelligent observers of various classes and pursuits, native and foreign, has been of a direct nature, whatever value it may possess as data for comparison with similar characteristics in other countries. It will be instructive and profitable towards proximate conclusions to have an accurate comparative statement of the meteorological conditions of some interesting portion of Brazil, relative to some well-known portion of the United States of similar geographical position. The points at which observations have been taken best affording data for comparison for any series of years are included in the one instance in the most southern state in Brazil, Rio Grande do Sul, and in the other in the State of North Carolina, the points of observation being Rio Grande and Wilmington, respectively. Their distance from the equator is about the same, varying but 2° 4′.

The State of Rio Grande do Sul extends from about 25° to 34° S. and contains 110,216 square miles. The State of North Carolina extends from 33° 53′ to 36° 33′ N. and covers 50,704 square miles. Both face the ocean to the southeast and in topographical features and physical characteristics bear considerable resemblance. In addition one lies along the warm current of the Gulf Stream and the shores of the other are washed by the southward flowing branch of the great equatorial current. These coincidences are striking, and those shown in many parts of the following tables are also interesting; but the object of the tables is less to demonstrate similarities than to show by these similarities, in connection with the pertinent information which precedes, the natural bases afforded for certain classes of agricultural production in the most temperate and favorable portion of Brazil as compared with a fairly comparable portion of the United States. The ultimate object is to give as clear and correct an idea as possible, not only of the natural conditions which govern agriculture as to character and class in Brazil, but also as to the natural, if not necessary, relation of Brazilian agriculture to our own, whether in similarity or diversity of product, and especially as the relation, through similarity or diversity, may bear upon interchange of production between the two countries.

The data used in the following tables which relate to Rio Grande do Sul are furnished in official statements made under date of July 31, 1890, by Consul L. G. Bennington to the Department of State. Those relating to Wilmington are arranged from the annual reports of the United States Signal Service:

Mean temperature, total rainfall, and mean humidity of the atmosphere at Rio Grande do Sul, Brazil, for the year 1888 and the average of each for the four years ending with 1888.

Month.	Temperature.		Rainfall.		Humidity.	
	1888.	Average for four years.	1888.	Average for four years.	1888.	Average for four years.
	°	°	*Inches.*	*Inches.*	*Per cent.*	*Per cent.*
January	74.6	75.5	1.2	2.6	73.7	84.9
February	76.4	75 6	.....	1.7	71.9	85.8
March	74.3	73.8	1.2	2.0	75.6	88.1
April	69.3	67.5	2.8	3.9	73.8	85.6
May	59.3	60.6	1.6	1.9	76.1	86.5
June	53.4	55.4	8.1	3.9	90	91.8
July	58.5	55.6	1.6	1.5	90.1	92
August	60.5	58.2	3.7	2.4	86.9	89.3
September	61.7	59.5	1.1	1.5	86	87.4
October	64.8	63.4	5.0	2.9	86.1	86.4
November	68.7	68.5	.6	1.6	74.4	82.9
December	75.1	73.0	1.0	2.1	77.1	80.1
Average	66.4	65.6	*27.9	*28.0	80.4	86.7

*Total.

Mean temperature, total precipitation, and mean humidity at Wilmington, N. C., for the year 1888 and the average of each for the four years ending with 1888.

Month.	Temperature.		Precipitation.		Humidity.	
	1888.	Average for four years.	1888.	Average for four years.	1888.	Average for four years.
	°	°	*Inches.*	*Inches.*	*Per cent.*	*Per cent.*
January	46.5	44.8	2.21	3.85	78	74.25
February	49.6	48.6	6.22	3.12	80	75.25
March	51.4	51.3	4.74	3.47	77	70.25
April	61.7	61.3	1.10	2.84	75	70.00
May	69.9	70.4	4.41	4.95	83	75.75
June	75.8	75.8	3.56	6.75	80	76.75
July	75.8	79.0	5.87	9.45	82	80.75
August	76.9	77.7	4.61	6.18	84	83.00
September	71.1	72.5	8.28	3.94	86	80.75
October	59 7	62.2	5.65	5.35	82	77.00
November	54.2	54.1	5.50	2.35	82	73.25
December	43.6	46.6	2.92	3.79	75	72.25
Average	61.4	62.0	*55.07	*56.04	80	75.77

*Total.

Differences between the averages of temperature, precipitation, and humidity, for four years ending with 1888, between the Rio Grande do Sul, Brazil, and Wilmington, N. C., United States.

Month.	Temperature.	Precipitation.	Humidity.
	°	*Inches.*	*Per cent.*
January	+30.7*	— 1.25	+10.65
February	+27.0	— 1.42	+10.55
March	+22.5	— 1.47	+17.85
April	+ 6.2	+ 1.06	+15.60
May	— 9.8	— 3.05	+10.75
June	—20.4	— 2.85	+15.05
July	—23.4	— 7.95	+11.25
August	—19.5	— 3.78	+ 6.30
September	—13.0	— 2.44	+ 6.65
October	+ 1.2	— 2.45	+ 9.40
November	+14.4	— .75	+ 9.65
December	+26.4	— 1.69	+ 7.85
Average annual excess or deficit	+ 3.5	—28.04	+10.96

*In this table the plus or minus is of Rio Grande do Sul above or below Wilmington.

From these tables it appears that in the average of four years the annual average of temperature was 3.5° higher at Rio Grande than at Wilmington, and of humidity 10.96* per cent higher, while the annual average of precipitation was less at Rio Grande by 28.04 inches. These records follow the course of the calendar year as to time; but remembering that the seasons are reverse south of the equator to those north of it, though not marked in the same way, it is evident that the proper relation of the facts tabulated to the seasons of production in the respective countries can only appear by a comparison which recognizes this natural arrangement, and places the productive seasons and their related meteorological data side by side. This true arrangement is presented in the following table:

Average annual differences in temperature, precipitation, and humidity between Rio Grande do Sul, Brazil, and Wilmington, N. C., United States, according to the seasons of natural production north and south of the equator, giving semiannual and annual results.

SUMMER.

Temperature.		Precipitation.		Humidity.	
Rio Grande do Sul.	Wilmington.	Rio Grande do Sul.	Wilmington.	Rio Grande do Sul.	Wilmington.
°	°	*Inches.*	*Inches.*	°	°
Oct.....63.4	Apr.....61.3	Oct.....2.90	Apr.....2.84	Oct.....86.40	Apr.....70.00
Nov.....68.5	May.....70.4	Nov.....1.60	May.....4.95	Nov.....82.90	May.....75.75
Dec.....73.0	June.....75.8	Dec.....2.10	June.....6.75	Dec.....80.10	June.....76.75
Jan.....75.5	July.....79.0	Jan.....2.60	July.....9.45	Jan.....84.90	July.....80.75
Feb.....75.6	Aug.....77.7	Feb.....1.70	Aug.....6.18	Feb.....85.80	Aug.....83.00
Mar.....73.8	Sept.....72.5	Mar.....2.10	Sept.....3.94	Mar.....88.10	Sept.....80.75

WINTER.

Apr.....67.5	Oct.....62.2	Apr.....3.90	Oct.....5.35	Apr.....85.60	Oct.....77.00
May.....60.6	Nov.....54.1	May.....1.90	Nov.....2.35	May.....86.50	Nov.....73.25
June.....55.4	Dec.....46.6	June.....3.90	Dec.....3.79	June.....91.80	Dec.....72.25
July.....55.6	Jan.....44.8	July.....1.50	Jan.....3.85	July.....92.00	Jan.....74.25
Aug.....58.2	Feb.....48.6	Aug.....2.40	Feb.....3.12	Aug.....89.30	Feb.....75.25
Sept.....59.5	Mar.....51.3	Sept.....1.50	Mar.....3.47	Sept.....87.40	Mar.....70.25

Average differences during the six summer months.

.....	*a*+1.2	.....	+21.21	+6.87	.....

Average differences during the six winter months.

+8.2	.....	.....	+ 6.83	+15.13	.....
Average ..+3.5	.....	.....	+28.04	+11.00	Annual differences.

a + In each instance, excess.

From the foregoing figures it appears that during the six months of crop production, from October to March in Brazil and from April to

* This total is 0.04 less than that in the following table, lost by not carrying out, in several instances, to a further extent.

September in the United States, including the "summer" of each hemisphere, the average temperature of Wilmington was for each such season in an average of four years 1.2° higher than at Rio Grande, and precipitation 21.21 inches greater; while the humidity was 6.87 per cent less than at Rio Grande. Also, that during the six months ordinarily of nonproduction, from April to September in Brazil and from October to March in the United States, including the "winter" of each hemisphere, the average temperature at Rio Grande was 8.2° higher than at Wilmington and the humidity 15.13 per cent greater; while the precipitation was again greater at Wilmington by 6.83 inches. There were, therefore, greater heat and rainfall to the extent shown, on an average, at Wilmington during the season of annual agricultural production, but greater moisture of the atmosphere at Rio Grande, to the extent shown. These conditions are on the whole more favorable to Wilmington than to Rio Grande as to the production of most of the cereals, if not all. They also apply to at least such portions of the two States, Rio Grande do Sul and North Carolina, as are included by corresponding bounds of latitude. If there are more favorable conditions because of higher elevation and farther distance inland, they apply in corresponding measure to each State and the same is to be said of soil.

Having thus presented at considerable length the evidence available from creditable sources relative to the soil, topographical features, and prevalent climate characters of the Republic of Brazil, the proper deductions from this evidence will not need to be suggested. It is, perhaps, apparent that Brazil is most fortunate as it is most tropical, in its relations through soil products to the needs of the world. It is also highly fortunate in relation to the needs of its own people, that varied local modifications, subservient generally to prevailing tropical conditions, give a wide range for natural and assisted production. But aside from the forest regions, and those where certain plants thrive by or in spite of excessive moisture and excessive heat in open fields, however rich the soil may be, there appear to be vast portions of country scarcely fit to be depended upon for even profitable grazing. What the real or comparative extent of this portion is, in the aggregate, is still unknown; and whether, and to what extent, it may be reduced to control by irrigation is equally uncertain, so far as published statements on Brazilian agriculture show. But wherever coffee plantations exist, covered themselves by a regular forest of greater trees, the seasons seem favorable, and the forests generally, wherever they exist, are luxuriant. The ground in these artificial and natural woodlands is shaded, and the tree roots reach beyond the drying power of the sun upon the soil; so that droughts that parch and crack the soil elsewhere, as well as excessive rains, have less effect here. So on the lands best suited to sugar cane, cotton, etc., the plants take root deeper than grasses, grains, etc., and are both cultivated and self-shaded besides,

and are therefore least liable to effects of extremes of moisture and dryness.

MEANS OF COMMUNICATION.

The highways in Brazil, as in most parts of South America, scarcely deserve the name in most instances, and need no description. They do not extend far into the interior, and vehicles, except of the rudest kind, are seldom seen upon them. Horseback riding prevails in travel upon land, and transportation of goods to and from the seaports and the railway stations is by pack animals mostly, mules and donkeys being extensively utilized. Transportation by water is employed upon the Amazon and its branches, utilizing several lines of steamers and some sailing vessels; but little such use is made of most of the other rivers, as navigation is intercepted by waterfalls at comparatively short distances from the sea. The Amazon is 3,900 miles long, and with its branches furnishes over 13,500 miles of water ways, most of which are navigable. The length of the other considerable rivers aggregates over 2,400 miles, which can be and doubtless will ultimately be made continuously navigable. The Amazon Valley, except upon its north side, is never likely to have other than water communication, owing to both the character of the surface and want of sufficient demand for railways. The Amazon has long been open to the free navigation of the world. Brazil, like all of South America except Venezuela, seems to be without great lakes.

According to the report made by Senhor Valente, delegate from Brazil, to the committee on railway communication of the American International Conference upon the railways of Brazil as of January 1, 1888, that country had then in operation 63 railroads, aggregating 5,273 miles in length, which cost $190,705,163. In addition there are 20 roads in course of construction, 869 miles long, and 25 under survey, projected for 2,235 miles. The cost of building all these roads is given in this report at $300,291,819. The longest line extends 725 miles, in São Paulo and Minas Geraes, and the shortest, in Rio Janeiro, is but 4 miles long. The cost of the first was $72,104 per mile, and of the last $82,685.

POSTS AND TELEGRAPHS.

The first attempt to establish a postal service was in 1808. In 1878 the present accommodations for the central postal administration were established, and the service has since been greatly improved and extended. Letters have been distributed in the principal cities since 1844. There are 19 distributing centers, besides Rio de Janeiro, and over 2,000 postal agencies now in Brazil, with some 6,000 employés.

All the principal coast and inland cities, with a few exceptions, are connected by government telegraphs, and these are being extended to cities in Matto Grosso, and to Manaos, up the Amazon. There are also

the telegraphs of the railway companies not owned by the Government. There is also a submarine cable from Pará to Montevideo, Uruguay, and another from Pernambuco to Lisbon, Portugal; and still another, recently established, which connects Pará with New York by way of Venezuela and the West Indies. Telephone service in connection with that of the telegraph is being introduced through the country under direction of the ministry of agriculture.

GOVERNMENT FINANCES.

The Government debt in 1889 amounted to $516,564,178, according to the Handbook of American Republics, published by the United States Department of State. The financial situation of the country appears to be sound, paper money being at a premium above gold; and a recent official statement by the Government, after investigation, is that fiscal matters are in a satisfactory condition. The principal sources of revenue are import duties, export duties, and stamped paper of various classes. The revenues and expenditures are exhibited in detail as follows:

National income and expenses of the Republic of Brazil for the fiscal year ending June 30, 1890, as reported by the finance department.

Revenue.		Expenditure.	
Imports	$47,502,000	Home	$5,037,684
Port dues, etc	1,414,140	Foreign affairs	439,916
Exports	8,206,380	Justice	4,267,850
Railways	7,338,240	Navy	6,276,272
Posts and telegraphs	1,638,000	War	8,186,993
Stamps, succession, and other duties	10,439,520	Public works	24,449,469
Other receipts	1,533,987	Finance	33,907,783
Total	77,072,267	Total	82,565,967

BRAZILIAN PRODUCTIONS.

The principal productions, and all those which enter into foreign commerce, are agricultural, excepting diamonds. Manufacturing upon a large scale is almost unknown, except that cotton manufacturing has recently begun, and mills for wheat-grinding are in operation at Rio, using imported wheat. Coffee is the great staple product, exceeding all the others in value. Its production has steadily increased, and the rate of increase seems to have borne some relation to the progress made toward the extinction of slavery. In "Brazil in 1889," before quoted from, it is stated that from 1835 to 1840, while the slave trade yet existed, the total annual production equaled 88,000,000 pounds; from 1855 to 1860, when the slave trade had ceased, the annual product equaled 264,000,000 pounds; from 1872 to 1877, when emancipation by purchase was in progress, the product was 389,000,000 pounds annually; from 1877 to 1882, when the abolition propaganda was organized, it was 770,000,000 pounds, and since the abolition of slavery it has risen still

further to 880,000,000. The area for coffee-culture in Brazil is practically unlimited, and coffee and caoutchouc, or rubber gum, her easiest and surest productions and most reliable articles for export, of considerable magnitude in the commerce of the world.

The latest available official report of the total exports of principal articles from Brazil, which shows her surplus production, was made by the minister of finance to Congress on the 6th day of May, 1887, for the three years ending June 30, 1886, and the figures, reduced to our weight and currency values, are as follows:

Official statement of the exports of principal articles of production of Brazil and values thereof during the fiscal years stated.

Articles.	Years ended June 30—	Weight.	Export value.
		Pounds.	
Coffee	1884	703,218,899	$62,763,600
	1885	825,164,143	73,548,440
	1886	719,109,656	60,212,140
Sugar	1884	726,140,125	18,881,190
	1885	545,221,831	10,952,750
	1886	247,794,835	6,795,530
Caoutchouc	1884	20,176,499	4,564,450
	1885	17,425,158	5,126,080
	1886	18,044,651	5,515,940
Tobacco	1884	37,681,023	2,300,560
	1885	43,280,707	3,261,700
	1886	57,107,958	3,508,740
Leather	1884	23,505,445	2,124,930
	1885	22,702,971	2,478,120
	1886	36,966,733	3,655,420
Cotton	1884	72,057,351	6,145,120
	1885	53,582,803	5,280,480
	1886	33,188,048	3,124,670
Cacao	1884	9,274,752	1,163,960
	1885	9,953,769	1,146,420
	1886	9,228,456	1,046,060
Yerba maté	1884	12,138,528	426,530
	1885	9,572,373	330,030
	1886	32,381,165	1,105,890
Brazil nuts	1884	12,749,202	860,780
	1885	12,268,599	625,320
	1886	12,266,394	619,530

The coffee production of the world is variously estimated at from 1,250,000,000 to 1,415,000,000 pounds per annum, the latter being the estimate in round numbers of the American Grocer of the crop of 1888–'89. Of this amount Brazil furnishes at the lowest estimate 812,000,000 pounds, and according to "Brazil in 1889," 880,000,000.

The production of caoutchouc or the gum of the rubber tree in Brazil has probably increased within a few years. The table above states the amount for 1886 at 18,044,651 pounds, while the amount imported in that year from Brazil into the United States alone was 17,462,699 pounds, and that into England 10,186,176 pounds. The Brazilian statement is evidently incomplete.

It has been seen that wheat as a paying crop on any large scale has disappeared from Brazilian agriculture. It has only been claimed that wheat could be grown in the States of Rio Grande do Sul, Paraná, Santa Catharina, São Paulo, and Minas Geraes, and of these States it

is admitted that the first named is the best. The physical and meteorological conditions of this State have herein been given in comparison with those of North Carolina, in the corresponding northern latitude. As it is a matter of interest for farmers of the United States to know in what, if anything, competition can consist between the productions of the two largest American republics, what Brazil has produced or is suited to produce in wheat is important.

Whatever wheat is raised in Brazil is stated by our consular officers to be produced upon the farms of the immigrant population, in the southern States, farthest from the equator. They also state that no Brazilian wheat goes to the flour mills of Rio de Janeiro, which are supplied by importations from the Argentine Republic and the United States. Consul Bennington states that of the million population of Rio Grande do Sul not a hundred thousand derive a living from agriculture, and that wheat-farming was abandoned about 1820 for stock-raising. The statement of the senator from Rio Grande heretofore quoted is referred to also in this connection. The "Politico-Economic Memoirs" of José G. Chaves, a Brazilian writer of 1822, show the wheat production of each year for the sixteen years ending with 1820 in Rio Grande do Sul, and the aggregate of the widely fluctuating but generally decreasing column is only 3,006,589 bushels, or less by 150,000 bushels for the sixteen years than North Carolina produced in the one year 1889. Taking all the evidence herein presented, it does not appear that we shall lack for a wheat and flour market in Brazil, especially as free entry into Brazil from the United States is secured by the reciprocity treaty.

DOMESTIC ANIMALS.

Large as the number of domestic animals may be supposed to be there is no information as to their numbers. The last census, in 1872, does not seem to have done more than enumerate and classify the population. Land and stock were equally free from taxation, and the real wealth of the States and the country, both in real and personal possessions, was never ascertained. Cattle are raised only or at least principally for their hides, tallow, horns, and their meat to some extent, and for bullock teams incidentally; horses for riding purposes in the country, and for driving to some extent in the cities; mules and asses for work of all kinds, and goats, hogs, and sheep for obvious purposes. The principal herds seem to pertain to the interior of the more southern States, and to be of inferior breeds, upon which little care has been bestowed for improvement.

FOREIGN COMMERCE OF BRAZIL.

The latest available statement of the foreign trade of Brazil, with principal countries only, is that for 1888, given in "Trade and Transportation between the United States and Spanish America," prepared

in the Department of State. In that publication the imports and exports are shown as follows:

Countries.	Imports from Brazil.	Exports to Brazil.
England	$26, 177, 259	$39, 654, 720
France	22, 538, 478	21, 112, 617
Germany	7, 260, 722	13, 321, 412
Spain	5, 680, 821	8, 316, 811
United States	53, 710, 234	7, 063, 892
Total	115, 367, 514	89, 469, 452

The total of this trade is $204,836,966, besides which Brazil received over $33,000,000 in coin from England, making the total of exchange over $237,000,000. Of the amount of imports from Brazil the per cent of the United States was over 46.5, and of exports to Brazil shown in the table, about 8.3. The character of the articles entering into this commerce is shown in the table of Brazilian productions under a previous head.

COMMERCE WITH THE UNITED STATES.

The value of the exports of Brazil to the United States for a series of years ending June 30, 1890, which shows considerable increase, is shown in the following table, taken from the commercial returns of the Treasury Department. The named articles are all farm or soil products.

Articles.	1880.	1884.	1886.	1888.	1890.
Coffee	$37, 855, 578	$30, 021, 573	$26, 384, 150	$33, 460, 595	$45, 664, 127
Hides and skins	2, 255, 640	1, 034, 029	2, 283, 001	1, 659, 286	2, 177, 882
Caoutchouc	4, 874, 234	7, 246, 828	6, 894, 689	10, 811, 952	9, 157, 248
Sugar, brown	5, 897, 102	10, 986, 870	5, 506, 507	6, 752, 555	1, 659, 251
Wool, unmanufactured	113, 645	55, 409	151, 074	65, 001	23, 390
Other articles	973, 891	921, 180	688, 111	960, 845	636, 858
Total	51, 970, 090	50, 265, 889	41, 907, 532	53, 710, 234	59, 318, 756

The value of the imports of domestic products from the United States into Brazil during these same years was respectively $8,496,696 for 1880; $8,645,261 for 1884; $6,480,738 for 1886; $7,063,892 for 1888, and $11,902,496 for 1890. This shows an increase of Brazilian exports to the United States including and since 1880 of the value of $7,348,666; an increase of imports from us amounting to $3,405,800; and a total increase in trade between the two countries equal to $10,754,466. The character of the exports to us has been shown. The character of the imports of Brazil from us, our exports to Brazil, and particularly of those immediately interesting to agriculturists, will appear under the following division of the subject. Our whole trade with Brazil was $71,221,252.

It is perhaps worth noting, in passing, that of our exports to Brazil

in 1888, the goods were sent in 75 American vessels of 63,581 tons, and 151 foreign vessels of 83,728 tons, and that our imports from Brazil were brought by 71 American vessels of 57,808 tons, and 497 foreign vessels of 331,985 tons. Of the imports the value of the goods brought in American vessels was $10,691,446, and of those brought in foreign vessels $43,018,788. The control of our carrying trade is so arranged, under other flags, that the ships which bring us goods, by triangular voyages between Europe, the United States, and Central and South America, carry goods to the latter from their own countries, and leave us to sell and deliver as best we can.

RECIPROCAL TRADE.

By the tariff act of the United States approved October 1, 1890, section 3, it was provided as follows:

That, with a view to secure reciprocal trade with countries producing the following articles, and for this purpose, on and after the 1st day of January, 1892, whenever and so often as the President shall be satisfied that the Government of any country producing and exporting sugars, molasses, coffee, tea, and hides, raw and uncured, or any of such articles, imposes duties or other exactions upon the agricultural or other products of the United States, which, in view of the free introduction of such sugar, molasses, coffee, tea, and hides into the United States, he may deem to be reciprocally unequal and unreasonable, he shall have the power, and it shall be his duty to suspend, by proclamation to that effect, the provisions of this act relating to the free introduction of such sugar, molasses, coffee, tea, and hides, the production of such country, for such time as he shall deem just, and in such case and during such suspension duties shall be levied, collected, and paid upon sugar, molasses, coffee, tea, and hides, the product of or exported from such designated country, etc., putting back the duties upon these articles generally as they were seven years ago.

Brazil being the largest of the South American republics, and our trade with her and the balance against us being also greatest, naturally she is the first with which the reciprocity contemplated by the foregoing provision has been secured, by which we gain an equitable return for the remission of duties upon imports of coffee, sugar, molasses, and hides from her. Reciprocity was proclaimed as in legal effect of the date of April 1, 1891, by the President of the United States, and is now in full operation as to the imports named, and the articles of export to Brazil from this country enumerated in the proclamation according to its terms. The following statement gives the names of articles admitted free under this arrangement, as enumerated in the proclamation, and those admitted at a reduction of duty of 25 per cent, with the values of such articles imported into Brazil from the United States during the fiscal year ending June 30, 1890; and it also shows the amount of agricultural products and their percentage relative to the whole reciprocal exports as well as to the whole amount of exports, favored or otherwise. This statement therefore becomes an analysis of our exports to Brazil and of the benefits reciprocity confers upon our own agriculture in this instance, on the basis of that year's trade.

Exports of articles made free to Brazil, 1890.

Wheat	$1,616,158
Wheat flour	3,304,990
Other breadstuffs	52,498
Potatoes, beans, and peas	43,368
Hay and oats	236
Pork, bacon, etc	456,873
Fish, dried, pickled, etc	2,265
Cotton-seed oil	8,794
Coal, anthracite and bituminous	46,750
Rosin, tar, pitch, etc	91,808
Agricultural tools and machinery	49,610
Mining and mechanical machinery	120,180
Instruments and books for arts and sciences	222,063
Railway construction, material, and equipment	736,960
Total value	6,752,553
Total agricultural	5,574,725
Per cent of agricultural	82.55

Exports of articles reduced 25 per cent to Brazil, 1890.

Lard substitutes	$1,509,255
Bacon hams	1,678
Butter and cheese	19,907
Canned meats, fish, vegetables, etc	9,586
Cotton manufactures	813,700
Manufactures of iron and steel	548,921
Manufactures of leather, except boots and shoes	14,667
Lumber, etc	494,750
Rubber, manufactured	9,648
Total value	2,422,112
Total agricultural	1,540,426
Per cent of agricultural	63.60

By the foregoing lists it appears that on the basis of the articles and amounts of our exports to Brazil in 1890, goods of the value of $9,174,665 were made subject to reduction and free entry in her ports; and as our total exports to Brazil aggregated $11,902,496, the amount affected by reciprocity was nearly 78 per cent of the whole. Of the amount so affected, viz, $9,174,665, the sum of $7,114,151 was in agricultural products, or 77.54 per cent. The percentages respectively in the free list and the reduction list are shown at the foot of the figure columns. These are encouraging to agricultural interests, and increase of exports, which seems sure to follow, will magnify their importance, and probably increase their ratio.

But it is not so much in the increase of our agricultural exports and others to Brazil that the benefits of the established reciprocal arrangements lie, so far as the increase is concerned. It is more in the fact that all that part of Spanish America from which we derive coffee, sugar, etc., will be compelled to make with us similar arrangements, or

to submit to the alternative presented in the third section of the act, before quoted. Already reciprocity has been arranged, with Spain relative to the Spanish West Indies, and with Santo Domingo, San Salvador, Nicaragua and British Guiana, by which, as with Brazil, it is expected that our exports, principally of agricultural products, will help not only to wipe out the large balance of trade against us, but to increase nearly or quite to the same extent the volume of the trade. The balance against us in 1890 with Brazil was $47,416,260; with Cuba and Porto Rico, which both depend upon us as purchasers of sugar, it was $42,938,008 in a total trade of $72,772,416; the combined balances against us for the year being $90,354,268. An increase of market to this extent for our productions almost at once certainly means greatly more for the future than these figures show.

IMPORT AND EXPORT DUTIES.

It has been noted that the constitution of Brazil provides that after the year 1895 export duties shall cease. At the present time export duties are levied by the different States, for their own needs, at different rates, and by the Government in addition at a fixed rate. The Government rates were stated in 1889 by the director of statistics of the ministry of finance of Brazil, in a letter to the American minister, as follows:

Articles.	Duty.	Articles.	Duty.
	Per cent.		*Per cent.*
Rum	9	Brazil wood	9
Hair (horse)	9	Piassava (for brooms)	9
Cocoa	9	Coffee	7
Chestnuts	9	Wool	7
Hides	9	Gold, silver	2½
Tobacco	9	Gold melted, or bullion	1½
Gum (elastic)	9	Diamonds	1
Timber	9	All other products, not exempt by law.	5

Additional export duties by the States from which shipments are made, however, make them much higher. For instance, the whole duty upon rubber gum at the port of Pará, through which the product of the Amazonian region is shipped, is 21 per cent ad valorem. In Pernambuco the tax upon sugar in 1890 was 3 per cent and 5 cents per bag or barrel; upon hides, 20 per cent; goat and sheep skins, 10 per cent; half hides from other States, 25 per cent; dry salted hides, 3 per cent, etc. This was the State tax. The tax upon coffee by the different States varies, and is hard to determine; but with the addition of the Government 7 per cent it appears to vary from 11 to 16 per cent ad valorem. At Santos it is 14 per cent; cacao, 16; hides, 19; tobacco, 16; rubber, 14; Brazil wood, 23; and piassava, 20 per cent. The whole foreign trade of Rio Grande do Sul in 1887 was $3,288,248, nearly equally divided between imports and exports. The combined import and export duties were $1,362,810, or at the rate of over 41 per cent ad valorem.

By decree of the Provisional Government of Brazil, promulgated October 11, 1890, a scale of duties on imports was put in force which still continues, from which the following extracts are made relating to agricultural and kindred articles of present interest, viz:

Articles.	Duty.	Articles.	Duty.
Animals:		Hops ..... per pound..	$0.032
Equine ..... each..	$10.80	Lard ..... do....	.049
Neat ..... do....	2.70	Maize ..... do....	.02
Sheep, swine, goats..... do....	.38	Meal ..... do....	.03
Bacon ..... per pound..	.03	Milk, prepared ..... do....	.068
Barley, beans ..... do....	.0074	Onions ..... do....	.02
Beef, fresh or dried ..... do....	.147	Potatoes..... do....	.0025
Butter..... do....	.142	Seeds, garden, flower, etc.....	Free.
Cheese ..... do....	.142	Wheat	Free.
Fruits and nuts, green..... do....	.015	Wheat flour ..... per pound..	.004
Fruits, dried ..... do....	.045	Wines:	
Hams ..... do....	.11	Sparkling ..... per liter..	.70
Hay and other forage ..... do....	.004	Not specified ..... do....	.08

CONCLUSION.

Such in general Brazil appears to be, in its physical character and conditions, and in those governmental and other artificial characteristics which influence its relations to the world relative to surplus productions and demands upon those exterior to it. Yet, being in great part an undeveloped and superficially explored country, no judgment can be passed upon it which may not be subject to some modification as development proceeds. The soil and climate characteristics, however, remain constant, and carry their dependent general conditions with them. Brazil is mainly under tropical natural forces, and her productions of soil which shall yield the most profit with the least labor will naturally correspond; and no endeavors of her population as a whole will sensibly alter or extensively modify natural conditions.

On the other hand, with increase of population and social improvement, and of production suited to climate, the demand for products of other countries will steadily increase; and upon such interchange of dissimilar productions between dissimilar portions of the world, involving the least conflict of labor systems and activities, and hence the least interference of conservative regulations, depends the fairest profits upon exchange, combined with the mimimum cost to consumers.

CHILE.

The Republic of Chile lies along the southwestern coast of South America, reaching from Peru to the southern extremity of the continent, and includes the islands south of the Strait of Magellan, except a portion of Tierra del Fuego and States Island, and also includes a few islands west of the central coast line, among which are Easter Island and Juan Fernandez, of Robinson Crusoe fame. According to an official publication of the Chilean Government issued in 1888 the Republic extends from 17° 57′ to 56° 35′ south latitude, is 2,750 miles long and from 106 to 186 miles wide, and contains 290,834 square miles; being a little less in extent than the area embraced in Texas, New Mexico, and the Indian Territory. The situation of the country and its topographical features give it all the varieties of climate except the arctic, while the Andean and subsidiary ranges of mountains, running generally parallel with the length of the country, multiply the local diversities, but limit their extent. On the whole the climatic characteristics are favorable to health, and with irrigation to a rich and considerably varied agricultural production.

PROVINCES AND POPULATION.

According to the latest official statements of 1890 and to the Chilean census of 1885 the Republic is divided into twenty-three provinces and one territory, and these into seventy-two departments. The intendants administering in the former and the governors of the latter are appointed by the President. The departments are divided into townships according to population, and the magistrates of these are elected by direct vote of the people.

The last census, taken in November, 1885, gives the population as 2,525,819, in which the excess of females was about 10,000. The increase from the census of 1875 was at the rate of 17 per cent. The following statement shows the principal political divisions of the country, their capitals, and the population at that date:

Provinces.	Capitals.	Area, square miles.	Population.
Aconcagua	San Felipe	6,226	144,125
Antofagasta	Antofagasta	61,004	21,213
Arauco	Lebu	4,247	73,658
Atacama	Copiapó	39,575	76,566
Bio-Bio	Los Anjeles	4,158	101,768
Cautin	Temuco	3,137	32,291
Chiloé	Ancud	3,994	73,270
Colchagua	San Fernando	3,794	155,687

Provinces.	Capitals.	Area, square miles.	Population.
Concepción	Concepción	3,535	182,459
Coquimbo	La Serena	12,905	176,344
Curicó	Curicó	2,933	100,002
Linares	Linares	3,489	110,759
Llanquihue	Puerto Montt	7,822	62,809
Malleco	Angol	2,857	59,492
Maule	Cauquenes	2,931	124,145
Ñuble	Chillán	3,556	149,871
O'Higgins	Rancagua	2,524	87,641
Santiago	Santiago	5,223	329,295
Tacna	Tacna	8,687	29,523
Talca	Talca	3,688	133,472
Tarapacá	Iquique	19,305	45,086
Valdivia	Valdivia	8,315	50,938
Valparaiso	Valparaiso	1,659	203,320
Territory.			
Magallanes	Punta Arenas	75,290	2,085
Total		290,834	2,525,819

It was estimated that fully 15 per cent of the population were not enumerated in the census returns, besides 50,000 Araucanian Indians, still considerably independent. With the addition of these the total population would amount to 2,954,691. About 35,000 Peruvians and 13,000 Bolivians have augmented the number of the population since the census of 1875, and there are about 37,000 people of other countries resident in Chile, including a thousand from the United States, making over 87,000 of foreign birth; and considerable colonization is constantly going on. Of the population nearly all are of European descent, or of mixed Caucasian and native Indian blood, there being no African element present.

TOPOGRAPHICAL FEATURES.

The Bulletin of the National Society of Agriculture of Chile for 1890 gives substantially the following description of the physical features of the country: The eastern side, throughout the most of its extent, runs up to the summit of the great Andean Range, which there divides Chile from the Argentine Republic and Bolivia; while to the west the Maritime or Coast Range, touching the coast at some points, follows the same general north and south course. Between these ranges the Central Valley of Chile extends from 33° to 41° 30′ of south latitude, nearly 590 miles, and it is this valley which gives an agricultural character to the country and contains its most flourishing towns and cities.

The Andes is the most remarkable of the mountain chains, rising into peaks of 22,300 feet in height, covered with snow during three-fourths of the year, and presenting few practicable defiles. The coast mountains reach an elevation of little more than 11,000 feet at their highest, and the chain is broken, presenting openings through which several rivers rising in the Andes flow to the Pacific. This range has much gentler slopes than the former, and is crowned with forests. From 41° 30′ the country changes its aspect, its valleys sink towards sea level,

its mountains are less bold, and finally the country becomes divided into numerous islands, which constitute the archipelagoes of Chiloé, Guaitecas, Guayaneco, Wellington, Madre de Dios, etc., which possess abundance of timber, considerable grass, and furnish facilities for extensive fishing enterprises, as yet improved only by the native Indians.

PHYSICAL DIVISIONS.

The same authority, approved by Mr. Theodore Child in an article upon Chilean agriculture,* recognizes the natural divisions of the country longitudinally into four industrial regions, as follows:

(1) The mineral belt lying between parallels 18° and 27°, including the provinces of Tacna, Tarapacá, Antofagasta, and the northern half of Atacama. The southern part of this belt is formed in part of narrow valleys, traversed by occasional streams and infrequently watered by rain. The vegetation is sparse, but becomes closer and stronger in the depressions of the Andes. There are deposits of guano along the coast, saltpeter, borax, and iodine in the center, and rich and abundant mines of copper, silver, and gold in the south. The climatic changes are great in this region, but it is not accounted unhealthful.

(2) The mineral and agricultural belt south of the preceding, comprising the southern part of Atacama and the provinces of Coquimbo and Aconcagua. This region possesses similar mineral wealth, and besides rich copper, silver, and gold mines, furnishes iron, manganese, lead, cinnabar, etc., while its valleys are more fertile and better watered than those of the first-named belt.

(3) The agricultural belt, comprised of the region between the parallels of 22° and 43° 30′ south, and embracing the provinces of Valparaiso, Santiago, O'Higgins, Colchagua, Curicó, Talca, Linares, Maule, Ñuble, Concepcion, Bio Bio, Arauco, Malleco, Cautin, Valdivia, and Llanquihue. These provinces nearly all lie in the Central Valley, which is well watered, has a mild climate, and a greater rainfall as the latitude increases. The soil is arable, productive, and full of nutriment, and woods abound towards the mountains along the coast. The vegetation of the Andean plains and valleys is luxuriant, excellent wheat, fruit, and vegetables are raised, and very good wine (red) is produced, while large beds of pit coal lie along the coast of Arauco and Concepcion.

(4) The forestry and fishery belt. This lies between 43° 30′ and 57° south latitude, where the Central Valley disappears and the mountain tops form the archipelago of Chiloé and other islands and groups whose plains are well adapted to stock-raising, etc. Rains are frequent and heavy here, the vegetation abundant, and the waters filled with fish, while whales and seals are numerous.

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* South American Republics.

CHARACTER OF THE SOIL.

Generally the soil of Chile ranges from good to excellent. The qualities which render portions of the country unavailable for ordinary agricultural purposes pertain to peculiar topography, climate, lack or excess of rain, as in the north in one case and in the south in the other, and the prevalence of certain minerals in what is called the mineral zone, and in a portion of the second previously noticed. The rocks which give character to the soil, according to the authority before quoted, are in the Coast Range granitic, while in the Andean region they are plutonic, of various character and periods, and the soil in the Central Valley, the true agricultural region, is composed of detritus from the volcanic output of these various rocks washed down by the numerous streams, and of alluvium left by an ancient lake system, apparently. Says Mr. Theodore Child:

A glance at the map will show, as it were, a continuous system of lakes in the center of this extreme southern zone, suggesting the hypothesis that in former times these lakes reached all up the coast between the two Cordilleras. This supposition is confirmed by an examination both of the northern deserts, and more particularly of the second and third zones, where the series of level valleys are evidently old sea bottoms, the basins of great lakes, whose waters on retiring, through plutonic action, left more or less rich deposits of soil brought down from the mountains. As you travel along the southern line you can distinguish lake after lake, each with its outlet, and each with its river or torrent, which continues to wash down from the mountains the alluvion that produces such rich crops.

CHARACTER OF THE CLIMATE.

Evidently a country not 200 miles wide, extending from 450 miles within the tropics to Cape Horn, bounded by a lofty range of mountains on one side and the Pacific Ocean on the other, must possess almost all variations of climate. Unfortunately there are no available continuous records of the meteorology of Chile, but there is instead a general concurrence between Chileans and travelers in their country in the opinion that the climate is mild and agreeable generally. It may be reasonably inferred that this concurrence applies to the central portion of the country, and especially the great Central Valley. In the northern part, west of the mountains, it is excessively dry, and the southern is exposed to abundant rains and a disagreeable temperature. In an article in the Bulletin of the National Society of Agriculture for August 5, 1890, Señor Le Feuvre says of the climate:

From the dry and luminous region in which rain is unknown to the gloomy and dark one in which the rainfall is continuous—from the tranquil, uniform, soft, and temperate to the tempestuous, variable, and constant snows—all climatic conditions are found in Chile. Nevertheless, in all its habitable portions its maximum extremes of temperature are much less than they are in European countries of the same latitudes. In Chile the winters are milder and the summers more moderate.

If only the arable portions of Chile be considered, it may be divided agriculturally into three great climatic regions, adapted to several or to special kinds of production.

(1) The northern region, which extends from the extreme north of Chile to Santiago. Here the humidity is slight, showers are rare and light, and occur only in the three winter months. Outside the desert region the rainy days in the year vary from 0 to 23, and the quantity of the annual rainfall ranges from 0 to 11.82 inches. The skies are nearly always clear and the intensity of the solar rays is great, but the nights are cool and the dew copious near the sea. The maximum temperature in the shade never exceeds 86°, and the minimum is never as low as 39°. Snow, frost, hail, and hurricanes are almost unknown. From want of moisture spontaneous vegetation is very limited, and there can be no agricultural production except with irrigation. But with irrigation the development of vegetation is wonderful.

(2) The central region, which includes the country between 33° and 37° south; that is, between the provinces of Valparaiso and Biobio. The humidity is slight on the northern border, but sufficient towards the south. Rain falls, but not abundantly, during the winter. Summer rain falls only in the extreme south of this region. There are from twenty to thirty days of rainfall in the north, and from fifty to sixty in the south of central Chile. The amount of the annual rainfall is from 15.76 to 23.64 inches at Santiago, and from 31.52 to 39.40 inches at Concepcion, in the extreme south. The summer winds blow from the cool southeast, and the winter winds from the northeast, a hot region. These conditions moderate the temperature of both seasons. The highest summer heat in the north is from 82° to 89.6° and from 72° to 82° in the south. The lowest temperature in Santiago and Concepcion rarely reaches 28° during the winter.

(3) The southern region, which extends from Biobio to Tierra del Fuego, and has a moist, showery, cloudy, temperate climate. The minimum temperature is from 32° to 38° in Valdivia and Chiloé, and at Punta Arena 17.6° to 19.4°. In Port Moutt there are one hundred and sixty-two days of rainfall in the year, and an average of 118 inches of rain; at Punta Arenas the average of days is one hundred and fifty, and of depth 23.64 inches.*a* * * * Ordinary cultivation is quite difficult in the southern part of Chile, because of the excess of moisture.

From the foregoing, in comparison with the previous description of the physical divisions of the country, it appears that the physical and climatic coincide, except that the first division of the latter includes two of the other. But there is a further peculiarity affecting the climate and, therefore, the agriculture of this interesting country. In each of the regions described there are three belts from north to south with strongly marked characteristics.

The coast belt is more damp and cloudy and has a more moderate climate than the others. That of the great central valley, with tributary transverse valleys, is the one where the most favorable conditions for agricultural productions exist, irrigation being possible. The third belt is that of the Andean region, where pasturage for cattle is found, as well as timber, and which gives rise to the streams which feed the irrigating rills and enrich the soil with new and fresh additions.

The following table of mean temperatures at several of the provincial capitals from north to south is taken from an official publication of 1888, "The Republic of Chile," etc., and is the most definite to be obtained relative to prevailing thermal conditions. The record of the

a This amount, "600 millimeters" in the original, must be a mistake, as it is less than the average at Conception, which is in a far drier climate.

centigrade thermometer is here reduced to Fahrenheit, and is for the central month of each of the four seasons:

Locations.	Mean temperature for—				
	January.	April.	July.	October.	The year.
Arica	71.6	68.0	63.1	66.0	67.5
Caldera	67.8	63.3	55.4	62.1	61.7
Copiapó	70.3	61.2	53.1	61.9	61.7
Serena	65.1	59.5	53.1	58.8	59.2
Coquimbo	65.1	60.3	54.5	60.1	60.1
Valparaiso	63.1	57.6	52.5	56.8	57.6
Santiago	66.2	55.0	45.0	55.4	55.6
Constitucion	62.6	56.5	50.0	56.1	56.3
Talca	70.2	55.8	45.0	57.2	56.5
Valdivia	61.5	52.7	45 0	52.3	52.9
Corral	60.4	53.6	46.9	52.7	53.4
Puerto Montt	59.0	52.2	45.0	50.9	51.8
Ancud	56.5	50.5	45.9	50.2	50.7
Punta Arenas	51.3	42.2	34.9	44.2	43.2

AGRICULTURAL AREA AND PRODUCTIONS.

The portion of Chile known particularly as the agricultural region, in which tilling the soil is almost the only industry, contains an area of 67,840 square miles, or 43,417,600 acres, and is a little less in extent than the State of Missouri. This rich farming region is 23⅓ per cent of the whole of Chile. There is still further an area of about 30,000,000 acres, of which 13,000,000 lie in the arid northern part, much of which can be utilized for certain agricultural purposes, as for forage and stock; or crops and vineyards, with irrigation, in the dry, half-mineral belt.

A very good description of the agricultural or central valley region is contained in a letter written from Santiago in April, 1891, by Mrs. F. B. Ward, who writes understandingly and with judgment of several South American Republics. The letter says:

Hereabouts in central Chile the country is gently undulating, the hills on both sides covered with green shrubs and the valleys crowded with vineyards, orchards, and fields of barley and clover.

The land is generally owned in immense estates, and irrigation is necessary in nearly all the coast districts. Yet there is no lack of rivers in Chile, as many as seventy-eight of them being deep enough to float craft of various kinds, with a total navigable length of 2,800 miles, not to mention a multitude of smaller streams and numerous lakes. Farther in the interior the climate is more equable than so near the Pacific, and the soil is prodigiously fertile. Notwithstanding the rude methods of agriculture yet in vogue the wheat crop is enormous, and there is a remarkable yield of other products, notably potatoes, considering the limited area devoted to farming.

The Chilean farmer, as a rule, still plows with a sharp-pointed piece of wood, sometimes shod with iron, sometimes not, and has never known any better harrow than a bundle of brush, while all the thrashing of his enormous crops is done by the primitive method of driving horses to and fro over the grain.

While the statements in the last paragraph are to a considerable ex-

tent still true, especially relative to small or remote estates, they must be modified as to larger ones and in view of considerable recent progress. Says Señor Le Feuvre, in the bulletin of the National Society of Agriculture, before quoted from:

Chilean agriculture has been up to the present time limited to an extensive cultivation of cereals and to cattle-breeding without care from man. The machinery and implements used were rude, primitive, and of little value. But in the last fifteen or twenty years an immense advance has been made with regard to agricultural products, in abandoning ancient and primitive methods, and becoming more progressive, especially in those regions where irrigation is practiced. * * * In like manner machinery for special agricultural purposes and products, with implements pertaining thereto, have become a necessity and are being rapidly spread throughout the country. The National Agricultural Society by its fairs and exhibitions, and the Quinta Normal (the national experiment farm) by its teachings, have proved powerful stimulants to the replacement of the mass of primitive Chilean agricultural implements by improved machinery adapted to the needs of the country.

And the writer enumerates the kinds of improved implements and machinery introduced, particularly upon the large estates, including in the list the best known to progressive agriculture.

Throwing further light upon the conditions of agriculture in Chile, the same writer further states as follows:

Landed property is divided into large, medium-sized, and small farms of a hundred hectares.* Large haciendas of 10,000 hectares are more generally found in the mountain regions of the Andes and of the coast and in southern Chile. Medium farms, which are but subdivisions of the haciendas, have greatly increased since the abrogation of the law of primogeniture.

The proprietors, who live constantly or a part of the year upon their estates, take charge of them; and a taste for country life is more frequently found among the higher classes. As a general thing the sons of the proprietors become farmers themselves and the managers of their own properties. The large and secure fortunes are found among the agriculturists.

The writer claims that the tendency is toward more and more subdivision of lands, and evidences progress.

The following statements of production of Chilean agriculture for the year 1874 are taken from the census returns for 1875, published by the Government. As it is impossible at present to obtain the Chilean census returns of 1885, no comparison as to progress which has surely taken place can be here made. But the statements by themselves show the leading articles of production, the amounts produced for the year, the average yield per acre of cereals, and the percentage returned for the seed sown.

* Hectare = 2.4711 acres.

Crops.	Product.	Yield per acre.	Return to seed sown.
Wheat:			
White ..... bushels..	10, 865, 150	12.2	8 to 1
Yellow ..... do....	1, 763, 697	16.0	8 to 1
Total wheat	12, 628, 847		
Barley ..... bushels..	2, 841, 150	19.1	11 to 1
Maize ..... do....	4, 854, 211	42.1	17 to 1
Beans ..... do....	882, 599	12.1	9 to 1
Lentils ..... do....	6, 193	10.8	9 to 1
Chick pease ..... do....	11, 938	4.0	8 to 1
Vetches ..... do....	314, 860	7.3	5 to 1
Potatoes ..... do....	4, 123, 461	88.5	6 to 1
Flaxseed ..... do....	41, 808	5.7	7 to 1
Rye ..... do....	11, 783	10.3	6 to 1
Hempseed ..... do....	22, 609	15.6	8 to 1
Nuts ..... do....	69, 708	.....	.....
Undressed hemp ..... pounds..	702. 174	.....	.....
Undressed flax ..... do....	48, 880	.....	.....
Wool clip ..... do....	4, 722, 028	.....	.....
Dried meat ..... do....	2, 149, 115	.....	.....
Tallow ..... do....	3, 843, 419	.....	.....
Wines:			
Chicha* ..... gallons..	7, 118, 278	.....	.....
Light red ..... do....	5, 192, 407	.....	.....
Unfermented ..... do....	6, 455, 181	.....	.....
Bordeaux ..... do....	643, 575	.....	.....
Total wine	19, 409, 441	.....	.....
Liquors:			
From grapes aguardiente ..... gallons..	1, 083, 834	.....	.....
Cognac ..... do....	7, 919	.....	.....

*A species of champagne made from boiled and clarified grape juice.

The census returns as published show the extent of each cultivated area, the names of the owners, and the amounts of each individual crop. The foregoing is abstracted from the summary of farm productions. From what is said upon all hands relative to the fertility of the soil, the yield per acre, and the production in proportion to the seed sown are remarkable only because of their moderation. It is evident that the success of Chilean agriculture in 1874 depended more upon the kindness of the soil and climate than upon improved agricultural methods. Still, the total yield of wheat in 1874, as given by the census, was greater than that of 1888 as given in the Bulletin of the National Society of Agriculture by 2,725,097 bushels, although better methods have been adopted and a greater yield per acre secured.

Señor Le Feuvre states, in that publication for September 5, 1890, that the cultivation of wheat, whether in irrigated fields or not, is now simpler and more economical than formerly, because of the use of machinery and modern implements. He says also, in this connection, that "the yield varies from 10 to 16 hectoliters per hectare on land not irrigated, and from 20 to 30 on the irrigated." This is equivalent to a yield of from 11.5 to 18.4 bushels per acre in the first case, and of 23 to 34.4 bushels in the last. If such an average rate of increase has been achieved, there certainly has been progress in Chilean agriculture, and to a gratifying extent.

The falling off in the total amount of wheat produced is possibly a still further evidence of real progress. When the new methods of milling became prevalent in the United States and in Europe they were

not promptly adopted in Chile, a considerable exporter of flour made from her own wheat. The consequences were that her export and then production fell off, and that more area and attention were given to other branches of agricultural production. Grape culture and wine making have rapidly and greatly augmented at the expense of the old wheat areas to considerable extent. The "causes of the decadence of the milling industry in Chile" are the subject of an article in the Bulletin herein referred to, for August 20, 1890, in which it is stated authoritatively that "from 1864 to 1868, inclusive, 2,009,845 metric quintals of flour were exported from Chile, while from 1884 to 1888, inclusive, the exportation only reached 253,891 metric quintals." The amount exported in the first-named period was equivalent to 2,260,686 barrels, and that in the last to 285,578 barrels; a difference of 1,985,108 barrels in favor of the earlier period.

"Viticulture in Chile has only acquired importance in the last twenty-five years, and in consequence of the introduction of French vines and modern methods," says the able writer so freely quoted herein, Don René F. Le Feuvre, one of the directors of the National Society of Agriculture. He also states that the extension to which vineyards had attained in 1890 in Chile was 247,100 acres, all bearing fruit, and anticipates an extension in a few years (en pocos años) to 1,235,500 acres. The area suited to grape culture he estimates at over 7,500,000 acres.

The present current prices of Chilean wine in the home markets are as follows, expressed in United States money:

Wines of the year (new wines) of good quality, in barrels, 35 to 87 cents per gallon. Old wines, of good quality, $5.47 to $7.29 per dozen quarts; superior $9.12 to $13.68 per dozen quarts, both bottled and cased. Possibly these prices may interest the wine makers of California looking for a market. They are from the latest Government publications.

Next to wheat and grape production is that of barley as to value. Barley is used mostly in beer making, and as food for horses. Corn is raised principally to clear the soil of weeds, and as a support to the bean crops raised with it—seldom solely for grain production. Oats may be raised in abundance in the cool, moist southern region, but with rye seem to be little cultivated. Beans and other leguminous food plants are favorites in cultivation, as in all Spanish countries, and more potatoes are grown in Chile than in most of the South American republics. Cattle-raising does not appear to be much beyond home requirements, but great care has been taken to improve the breed of farm animals, and the same is true relative to horses, sheep (of which there are about 12,000,000), and swine.

In fact Chile is the foremost of South American countries in giving educational and money aid to the advancement of rural industries in all their branches, being approached most nearly by the Argentine Republic in this respect. The State Agricultural School and Farm at

Santiago, and several preparatory branches, draw students from other near countries and from Europe.

It was projected in 1870, and the Agricultural Institute has now and since 1883 established courses in the following, viz: Agriculture and rural economy; arboriculture and horticulture; vine culture and wine making; agricultural botany; agricultural zoölogy; zoötechnic and veterinary science; agricultural chemistry, mineralogy, and geology; analytical chemistry and agricultural technology; rural engineering and building, and rural legislation. There is also a National Society of Agriculture, which is vividly conscious of its opportunities and duties, and both institutions have the coöperation of wealthy and progressive Chilean gentlemen, of whom there are many.

The tax upon country property in Chile, and so upon agriculture, was formerly equal to one-tenth of the income or the rental. It is now a little less, and favor is shown the farmer in import duties. At present agricultural machinery, and that used in grape culture, is free of duties.

MEANS OF COMMUNICATION.

There are numerous common roads in Chile, but not of excellent character nor kept in repair. Railways have become in many parts the cheapest as well as most rapid means of communication. Considering the size of the country and the number of the population, railways are numerous, and they are still being rapidly multiplied. Of those owned and operated by the State there are thirteen, the total length being 750 miles. There are also fifteen lines in operation, aggregating 1,070.5 miles in length, owned by individuals or corporations, and concessions have been made for ten more, now under way, aggregating 610 miles in length. With these completed Chile will have 2,430.7 miles of rapid communication, and these will be ultimately considerably extended. The average cost of the Government roads was $56,422 per mile.

PUBLIC SCHOOLS.

There is complete freedom in giving instruction in Chile, but the State reserves the right to have pupils examined by a board of public instruction before bestowing a diploma which will authorize the recipient to teach. Instruction in the public schools is gratuitous, except for boarding schools. The system is admirably arranged for thorough education from first to last. There were, in 1887, 27 high schools for men and 13 for women; 293 elementary for boys and 199 for girls, and 418 mixed. There were 43,640 male and 37,722 female students.

Upon these schools there was expended in 1888 $1,406,000. There are several normal schools for teachers. There are now sixty public schools in course of establishment in the several provinces, the buildings for which will accommodate 20,500 scholars. There are over 150 large academic buildings, in which 60,000 pupils can be received. There

are several fine libraries in the different cities, the National Library in Santiago containing 80,000 volumes, and the library of the National College 30,000. That of Congress has 5,000.

GOVERNMENT FINANCES.

The revenues of Chile are derived from import duties on merchandise, warehouse charges, export duties on saltpeter and iodine, taxes upon appraised country property, called the agricultural tax, duties on stamps and stamped paper, on letters patent and the introduction of new industries, donations and inheritances, personal property, use of government wharf at Valparaiso, from the railway, post, and telegraphic service, etc. The revenues for 1889 were $82,668,910 in United States money, and the expenditures $54,160,126. The customs revenue of that year was $34,485,390. The public debt, principally due to the war with Peru and Bolivia and to railway building, was, on January 1, 1890, $85,379,574.

FOREIGN COMMERCE.

The principal productions, in value and for export, of Chile are of the mines, the most of which are in the arid northern region. Of the $56,000,000 worth of exports in 1889 nearly $47,000,000 was in niter ($33,185,138), copper, and silver. The most of the agricultural export was of wheat, of $2,658,876 value. The whole trade of 1887 and 1889 is shown in the following statement, with the principal countries to and from which it flowed, viz:

Countries.	Imports.		Exports.	
	1887.	1889.	1877.	1889.
Great Britian	$18, 662, 788	$25, 437, 426	$41, 018, 910	$44, 135, 656
Germany	10, 608, 284	13, 487, 433	4, 624, 964	4, 937, 420
France	5, 016, 865	5, 972, 924	3, 020, 747	2, 046, 029
United States	2, 956, 990	3, 503, 975	2, 371, 582	3, 448, 647
Peru	2, 435, 539	3, 265, 911	958, 317	1, 305, 067
Argentine Republic	2, 022, 038	4, 775, 272	44, 724	40, 528
All others	2, 848, 741	2, 318, 152	4, 010, 680	4, 244, 999
Total	44, 351, 346	58, 761, 093	56, 049, 924	60, 158, 346

The following table shows the value of our trade with Chile during the fiscal year ending June 30, 1890, as shown by the Treasury report, and also the articles and values of the imports and exports of agricultural products between the two Republics:

Imports from Chile, 1890.

Articles.	Value.	Articles.	Value.
Carpet wools	$118, 948	Raisins	$27
Clothing wools	62, 281		
Goat skins	6, 699	Total agricultural imports	197, 724
Beans and pease	5, 555	Articles not agricultural	2, 985, 525
Nuts, except almonds	2, 492		
Seeds, except linseed	1, 046	Total imports	3, 183, 249
Cocoanuts	676		

Exports to Chile, 1890.

Articles.	Value.	Articles.	Value.
Sugar	$87,947	Seeds	$372
Lard oil	56,619	Vegetables, not canned	330
Lard	56,093	Molasses and sirup	201
Wheat	23,177	Cotton-seed oil	174
Linseed oil	8,900	Imitation butter	158
Beef, salted or pickled	8,112	Bread and biscuit	75
Grease and soap stock	7,239	Dried apples	40
Vegetables, canned	2,941	Game and poultry	32
Horses	2,200	Cheese	26
Pork, pickled	2,090	Beans and pease	24
Beef, canned	1,797	Bacon	15
Wheat flour	1,546	Butter	12
Fruits, preserved	1,051	Milk	6
Meat products, sundry	1,109		
Breadstuffs, sundry	660	Total agricultural exports	264,655
Vegetable oils, not cotton or linseed	650	Articles not agricultural	2,954,810
Cattle	600		
Hams	459	Total exports	3,219,465

GENERAL CONSIDERATIONS.

The climate of the truly agricultural portion of Chile so corresponds with that of our own agricultural regions, especially on the Pacific slope, that our mutual productions are similar, and there does not appear to be a probability of an extensive exchange in the line of such productions. The mineral products of that country are required in far greater quantities by Europe, and particularly Great Britain, than by us, and naturally find that outlet; and it is quite as natural, as we have avoided the field, that British enterprise should construct the railways and furnish the water carriage of Chile, and thus influence further the market and business of that rich and progressive country. However, it is gratifying to observe the singular fact that more than half the value of our own $6,402,714 worth of trade with Chile in 1890 was carried under our own flag by the Pacific mail line of steamers.

But while it is perhaps true that, except in the case of special articles of farm production, we are not likely to extend exchange or sale to a great extent for some time, it is also true that, while Chile is a non-manufacturing country and requires our illuminating oils, railway material and equipments, cloth and furniture manufactures, machinery and implements for the farm, scientific instruments, cordage, and various forest products, etc., agriculture in this country has both an indirect and, to some extent, a direct interest of gain in the supply and its steady increase; for the thrift of other great industries contributes through extended home demand to the fundamental one which tills the soil. And in an enlightened and prosperous community, such as that which directs the advance of our sister Republic, there will always, under favorable circumstances of intercourse, be more or less demand for the best we can supply.

COLOMBIA.

This country, embracing the northwestern portion of South America, and extending south beyond the equator, contains an area of 504,773 square miles, besides the undetermined area as to extent recently awarded to it and taken from Venezuela, and a population of nearly 4,000,000, or more than two-thirds that of the United States before the purchase of Louisiana, as to both extent and people. Including a part of the Andes, it is distinguished as mountainous, but has extensive table-lands in the interior, and a considerable extent of alluvial area along the Magdalena River and the coast. Generally, in topographical features, soil, climate, and productions, it is similar to its neighbors Venezuela and Ecuador.

Colombia is divided into nine departments, answering to States, with areas estimated, waiving the extent awarded, and population, respectively, as follows:

Departments.	Square miles.	Population.	Departments.	Square miles.	Population.
Antioquia	22,316	470,000	Panama	31,571	285,000
Bolivar	21,345	280,000	Santander	16,409	555,600
Boyacá	33,351	702,000	Tolima	18,069	306,000
Cauca	257,462	621,000			
Cundinamarca	79,810	569,000	Total	504,773	3,878,600
Magdalena	24,440	90,000			

Colombia publishes no information of value concerning its industrial or commercial activities, as it is not sought for by the people, and what is obtained must be found in the records of countries doing business with her or by personal observation. Bogota, the capital, lies inland about 250 miles, on a table-land about 8,500 feet above the sea, and can never feel strongly the pulse of the world except through an international railway connection. The country produces for export coffee, cacao, cinchona, dyewoods, sugar, hides and skins, fruits, rubber gum, ivory nuts, etc., and, like Venezuela, is rich in mineral resources, valuable woods for house furniture and finishing, and medicinal plants, some of which are of an importance not yet sufficiently appreciated (as that not long since discovered to be a specific for cholera infantum), and all of which are certain to be of continuous commercial interest. The climate is so salubrious generally in the interior and so hot and unhealthy, except for those acclimated, along the coast and lower river courses, as to have escaped, apparently, thermometric record.

GOVERNMENT AND REVENUE.

The government of the Republic of Colombia, as the country is legally designated, is divided into the three branches, executive, legislative, and judicial. The President is elected by restricted suffrage for six years and exercises his authority lawfully through eight ministers, who are, however, directly responsible to the Congress. A vice-president is elected for the same term and at the same time as the President, but Congress elects every two years a substitute for the President to fill the office in case of vacancy.

The Congress consists of a senate and a house of representatives. Each department chooses three senators, who must be natives, with incomes of $1,200 each, and 30 years of age. Representatives are elected by universal suffrage, one for each 50,000 inhabitants, and the only qualification is that they must be 25 years of age. The judicial system is that of the usual graded courts, from local to supreme.

The present constitution was adopted in 1886, by a national council, and by it the governors of the departments are appointed by the President, though each department still regulates its own finances.

The national revenue is mostly derived from customs duties. The official estimate for 1890–'91 was as follows, in United States values: Revenue, $14,127,826; expenditures, $17,723,063. For 1891–'92 it was: Revenue, $14,713,845; expenditures, $17,287,028. The foreign debt is stated by Bulletin No. 2 of the Bureau of American Republics at $14,571,318, mostly due to the British, and the total debt, including the interest, at $20,999,373.

MENTAL AND RELIGIOUS INSTRUCTION.

There are two universities and several colleges and technical schools in the Republic, besides fourteen normal schools, and nearly two thousand primary ones, with about 200,000 pupils, instructed gratuitously. The national religion is Roman Catholic, and there are many church schools. Other forms of worship are permitted. The press does not present an extended establishment nor influence, as a whole.

MEANS OF COMMUNICATION.

The roads of Colombia are mostly mule tracks and donkey paths, but for some years soldiers have been employed in improving the principal routes. Three lines of railway are operated, of 148 miles length, and five others are nearly completed. But the Magdalena River is the great highway of the country, however, and with six of its tributaries is likely to remain so indefinitely. It is in places wider than the Mississippi, with a strong current, and is navigable for 600 miles from Barranquilla by steamers of sufficient capacity to accommodate trade. It flows northward, as the Mississippi does southward, and the mouths of the two great rivers are only 1,020 geographical miles apart on north

and south lines. One will carry cheaply to a great seaport the developed productions of a rich tropical country demanded by this; the other will carry cheaply also to a greater seaport the agricultural products of the great valley of the Mississippi, with its twenty States, an increasing amount of which are necessary for tropical markets Other rivers, as the Zulia, communicate with Lake Maracaibo, and carry a large amount of Colombian coffee and some cacao to its important market. The principal connections for foreign trade are through the Magdalena River and Lake Maracaibo, not considering the transit trade across the isthmus. For international intercourse there are seven lines of steamers, besides sailing vessels and an occasional tramp. Of these 59 are British, aggregating 114,686 tons, one line at least being paid $100,943 per year by the British Government; 17 French, of 57,300 tons, supposed to be subsidized; 13 German, of 18,532 tons, and 10 Spanish, of 15,653 tons; in all 99 steamships, of 206,171 tons, not one of which carries our flag, or is interested in subserving our interests, and few of which touch at our ports.

THE PANAMA CANAL.

The attempt to construct an interoceanic canal across the isthmus, 46 miles long, after an expenditure of $154,509,082, and an unsuccessful attempt to raise a new loan, and then to form a new company, was suspended on the 15th of March, 1889. The old company went into liquidation, and the project of a canal at that point is not likely to be revived in the near future.

PRINCIPAL PRODUCTIONS.

Coffee is the principal article of plantation production. According to a report made in 1887 by Consul-General Walker, then of Bogota, to the Department of State, Colombian coffee is produced almost solely in the departments of Cundinamarca and Santander, which have a population of 1,124,600; but Boyacá, lying between them and having over 700,000 inhabitants, has recently become an acknowledged producer. Cundinamarca was estimated to have 3,000 acres (nearly 5 square miles) of plantations, producing 5,000,000 pounds, and Santander over 11 square miles, producing 12,000,000 pounds. Of the whole amount 10 per cent was supposed to be used in the country, leaving 15,300,000 pounds for export. This estimate of production is evidently too low, as the United States imported from Colombia 10,893,354 pounds during the year ending June 30, 1888, and England over 5,275,000 during that calendar year, which together exceed it, while a small amount also was sent to other countries; and during the year ending June 30, 1889, the imports of coffee from Colombia into the United States alone amounted to over 16,000,000 pounds. The three departments mentioned as most suitable to produce coffee have an area of 160,000 square miles; and of this if one fiftieth part, a low proportion, is suited to coffee production,

the possibilities of this area, even at the low rate given by Mr. Walker, promise a future supply of nearly six times the amount at present annually consumed in the United States, which is 578,397,454 pounds for 1889. In fact, coffee growing in Colombia, Venezuela, and other States and islands whose ports are 1,500 miles and less from ports of this country, has practically no limit except that caused by want of labor. This is proportionally true of Colombia; and for obvious causes coffee-producing countries will not become competitive nor usually self-sustaining in such food products as they now regularly draw from other climes.

Until recent years cinchona was the second in importance of Colombian productions, but exports have greatly decreased. The value of shipments to the United States, England, and France in 1879 was $5,740,000, of which $2,082,000 worth came to this country, against $11,826 worth in 1889. Hides and skins now hold second place, the export value in 1888 being $1,364,000; shipped to the United States, year ending June 30, 1889, $927,866. Other products of plantations, for export, are cocoanuts, cacao, bananas, sugar, and tobacco, and occasionally cotton and corn. India-rubber, vegetable ivory, dye and other woods, and gold and silver are also exported, but it is difficult to find in what amounts. The principal products for home use are, besides some of those named, rice, yucca, yams, sweet potatoes, Egyptian corn, many of the garden vegetables known to us, and the various tropical fruits; and besides domestic animals and fowls there is an abundance of game and excellent fish, with green turtle *ad libitum*. The latest census of farm and range stock gives the following numbers:

Kinds of stock.	Number.	Kinds of stock.	Number.
Neat cattle	949,072	Goats	610,147
Horses	140,735	Swine	343,542
Mules	41,520	Sheep	41,696
Asses	13,050		

In addition to these there were 58,280 horses, mules, and asses returned without separate enumeration.

Of the rice produced, in the region of Cartagena, our consul reports that the berry is so small that machinery has not been secured with which to successfully clean it. Some wheat is grown on the high lands, but it is not popular because its flour can not be made into light bread. As to cereal cultivation generally, the habits of the people, their farming implements, and the climate are against it. The plow used in Colombia and most of the tropics is the primitive, single-handle, wood plow of Algeria and Moorish Spain, oftenest without an iron-shod point, drawn by oxen yoked across the forehead firmly with a piece of timber and a rope or piece of rawhide; and although this instrument may disturb the soil, it helps as little as its owner towards reliable,

steady husbandry, such as is known alone to less enervating climes. Iron and steel plows have been introduced on some plantations, but have been invariably broken by the laborers at night, and abandoned. Just so was the first tramway torn up in Puerto Cabello.

FOREIGN COMMERCE.

The facts that Colon and Panama are free ports, through which a large transit trade is carried on across the Isthmus of Panama, and connected by place with it is a considerable export trade of the country; that there is no record kept of the destination of exports from the ports of Cucuta and Ipeles, and that the Government publishes no statements of trade, international or transit, make it impossible that any but an approximate statement should be made of the foreign commerce of Colombia. The principal part of such commerce appears to be with the United States, France, and Great Britain, with Germany as fourth, which latter gives the weight but not the value of articles in her commerce. The following table is arranged from values given in an article in "Commerce of the World," issued by the Department of State, for 1880, and from statistics of the Treasury Department for the year ending June 30, 1890, and is probably as accurate a statement as can be made of the foreign trade of Colombia with the countries named for that year. The direct imports are articles produced in the countries named; the indirect are products of other countries entered into their commerce; and the direct exports are of articles intended for consumption in the named countries. The classification, while showing the full value of the imports and exports respectively, exhibit also the true value of the productions of the several countries entering into those imports and the true extent of the demand of each upon the exports.

Imports and exports from Colombia, 1880.

	Imports.			Exports.		
	Direct.	Indirect.	Total.	Direct.	Indirect.	Total.
United States	$5,228,836	$108,478	$5,337,314	$8,441,972	.....	$8,444,972
Great Britain	5,054,000	166,000	5,220,000	2,795,000	$2,837,000	5,632,000
France	4,103,000	1,679,000	5,782,000	4,073,000	.....	4,073,000
Total	14,385,836	1,953,478	16,339,314	15,309,972	2,837,000	18,149,972

The Department of State estimates that the value of the trade of Colombia with other countries than those mentioned would bring the imports for the year up to nineteen millions and the exports to twenty. Unfortunately, neither this nor any other statement of the trade of Colombia, nor of any other country of South America, can be verified satisfactorily, especially in detail.

An attempt to show the foreign trade of Colombia for 1888 was made by United States Minister Abbott, derived from his inspection of the

customs returns of the country; and his reports, corrected by the Department of State upon the authority of the customs returns of this country, Great Britain, and France, and from the Statesman's Year-Book as to the trade of Germany, are the basis of the following tables. The indirect trade through France was with Belgium and Switzerland; that through the United States and Great Britain was with unascertained countries.

Imports of Colombia, 1888.

From—	Direct.	Indirect.	Total.
France	$7,874,000	$2,026,000	$9,900,000
Great Britain	5,236,000	272,000	5,508,000
The United States	4,923,259	100,621	5,023,880
Germany	1,010,304	.....	1,010,304
The Antilles	225,701	.....	225,701
Ecuador	171,147	.....	171,147
Spain	122.156	.....	122,156
Peru	16,690	.....	16,690
Italy	9,824	.....	9,824
All other countries	97,088	.....	97,088
Total	19,686,169	2,398,621	22,084,790

Exports of Colombia, 1888.

Destination.	Value.	Destination.	Value.
United States	$4,393,258	Italy	$6,685
Great Britain	4,109,843	Spain	4,813
Germany	1,532,305	Ecuador	1,785
France ($9,036) Belgium	1,159,894	Destination unknown:	
Antilles	181,226	Exports of Colon and Panama	1,682,293
Costa Rica	67,238	Exports of Ipeles and Cucuta	1,308,962
Venezuela	46,363		
Mexico	38,318	Total	14,551,076
Peru	18,699		

IMPORT DUTIES.

By the official tariff of Colombia now in force the following are the import duties collectible on the products named, per pound and in United States currency, reckoned from the value of the peso as of July 1, 1891, at 73.6 cents: *

Articles.	Duty.
Potatoes, onions, corn, rice, pease, beans, and all kinds of vetetables and fresh fruits	$0.003
Flour, including sago, arrowroot, tapioca, corn meal, and all similar products	.017
Prepared food, such as hams, sweetmeats, confectionery, preserved and dried fruits, etc., and all pickles and condiments not specially distinguished	.067
Olives in barrels	.033
White wines, sweet and dry, in pipes and barrels	.017
All other wines	.134
Tallow, raw	.003
Live animals	Free.
Tobacco, in the leaf and cut for cigarettes	.033
Red wines, common, in pipes, barrels, and demijohns	.008
Hops	.033
Seeds, shoots, and sprigs of live plants	.003

* Reduced in the Bureau of American Republics from kilos and pesos.

A detailed statement of the agricultural products of the United States imported into Colombia in 1889, published in the September report of this Department for 1890, showed the value to be $984,115. The average rate of duty of that country on imports seems to be about 63.1 per cent ad valorem, although it is only determinable approximately, best by comparing the amount of revenue presumably raised from imports with the value of the imports, upon most of which duties are payable. Taking three-fourths of the revenue to have been raised from imports in 1888, at the apparent rate stated, the above amount of agricultural products purchased from us paid $620,000 in duties, or over 64 per cent, the whole of the productions imported from us paying $3,101,653. At the same time the export duties of Colombia are not less than those of Brazil or Venezuela upon coffee, the principal article of export of the three countries, or 16 per cent ad valorem, which would make the duties collected on exports to us in 1888 $702,921, the whole duties collected on trade with us being $3,804,574 on a total trade of $9,417,138, or over 40 per cent of the amount of that trade. As an offset in our favor we collected duties on $148,890 worth of imports from Colombia, amounting, at the average rate on dutiable articles of 45.13 per cent, to $67,233. We also admitted free of duty the balance of our imports from her, upon which she had already collected an export duty, such balance being $4,244,368, and such remitted duties, at an average rate of 29.50 per cent on all articles free and dutiable, being $1,252,088. Such, substantially, are the trade conditions existing between two Republics whose ports are less than 1,500 miles apart, which lie on the natural trade line, produce little in common, and regularly require each the productions of the other, especially those of the soil.

ECUADOR.

The Republic of Ecuador dates from 1830 as an independent power, although it established its independence from Spain in 1822, in a decisive battle upon the side of Mount Pichincha, fought 10,200 feet above sea level; after which it became a part of the unstable Colombian federation formed under Bolivar, which included also all the north and west portion of South America down to Bolivia. The State derives its name from its situation upon the equator, but as its boundaries upon the north and south, with the United States of Colombia and Peru, are still undetermined, the area can only be given proximately. Orton, in "The Andes and Amazon," 1870, gives it at "about 200,000 square miles," with a seacoast of "1,200 miles." The American Almanac states it, following the planimetric calculation of Hanemann on the basis of Kiepert's map in his Hand Atlas of 1872, at a little over 248,000 square miles. This calculation does not assign to Ecuador the disputed territory along the Marañon, claimed also by Peru. The American Cyclopedia places the area at 252,000 square miles, to which it adds that of the Galápagos Islands, 2,951, making the total 254,951, while the Almanach de Gotha gives the highest estimate of 348,782 square miles. At the other extreme of estimates of this unsurveyed country, the Statesman's Year-book for 1891 and preceding years gives the area at 118,630 square miles, and the Hand Book of the American Republics, of February, 1891, follows this statement. The true area, however, will probably be nearest approximated from the map and information contained in the "Report of the International American Conference relative to an International Railway Line," published in 1890.

Ecuador is bounded on the east and west respectively by Brazil and the Pacific, and these boundaries, at least, shown by the map referred to to be on an average 800 miles apart, are not in dispute. A rectification of the line in dispute with the United States of Colombia could not place it farther south than the equator without taking away from Ecuador its capital, Quito; but that limit may be accepted eastward from Baeza, without loss of much territory on either side. It is understood that Ecuador claims on the south down to the Marañon, east of the Andes, as far as Tabatinga, but in the map referred to the boundary marked as in dispute is considerably north of the Marañon. The average distance between these northern and southern limits—the equator and the line given in the map as the boundary most favorable to Peru—is 325 miles. This multiplied by the length, 800 miles, gives a mainland area of 260,000 square miles, to which should be added the area

of the Galápagos Islands, 2,951 square miles, making the probable total area, from the best data available, at least 262,951 square miles, an area nearly equal to that of Colorado, Utah, and Nebraska combined. The coast line, according to the map referred to, is about 400 miles long, and has but one important, and two lesser ports, nearly all the foreign commerce of Ecuador passing through the city of Guayaquil, upon the gulf of that name.

POPULATION BY POLITICAL DIVISIONS.

By the last census, 1885, the population of Ecuador, aside from over 150,000 unsubdued Indians, was 1,004,651, distributed among the seventeen provinces in the numbers shown in the following table, which also contains the name of the chief city of each province, the extent being undetermined:

Province.	Population.	Capital.	Province.	Population.	Capital.
Asuay	104,369	Cuenca.	Loja	60,880	Loja.
Azogues, or Cañar	43,265	Azongues.	Los Rios	32,041	Babahoye.
Bolívar	31,327	Guaranda.	Manabi	64,284	Puerto Viejo.
Carchi	29,383	Tulcan.	Oriente	15,850	Archidona.
Chimborazo	90,782	Riobamba.	Oro	21,606	Machala.
Esmeraldas	11,146	Esmeraldas.	Pichincha	187,844	Quito.
Galápagos	204	Albemarle.	Tunguragua	79,526	Ambato.
Guayas	95,640	Guayaquil.			
Imbabura	56,476	Ibarra.	Total	1,004,651	
Léon	89,028	Latacunga.			

GOVERNMENT.

The executive authority in Ecuador is exercised by a President, who is selected by a college of 905 electors chosen by the people, for a term of four years. He is assisted by a vice-president, who is elected in the same manner, and who presides over the ministers constituting a council of state, which is responsible to Congress.

The legislative power is vested in the Congress, consisting of a senate and house of representatives, which meets biennially. Senators are elected for a term of four years, two for each province, one-half retiring every second year, and representatives at the rate of one for each 30,000 inhabitants for two years.

The judiciary consists of a supreme court, the members of which are elected by congress for a term of six years; a court of appeals, and provincial, district, canton, and parish courts, all under congressional jurisdiction.

The Roman Catholic Church is represented in the ministry, its creed is national, and electors must be members of it, and able to read and write.

NATIONAL FINANCES.

The money of Ecuador has the sucre for a unit of values, nominally equal to our dollar, but in effect of the value of only 73.6 cents of our money. The revenue of the country for 1889 is officially stated at

3,110,506 sucres ($2,289,332.42), and the expenditures at 3,075,424 sucres ($2,263,512.06). Of the entire revenue more than half, or $1,823,472.38, was derived from customs duties on imports at the port of Guayaquil. The foreign debt, contracted in England in 1885, amounted in 1890 to $10,932,884.24, which was diminished by concessions, in August of that year, to $3,649,875, bearing interest progressive for a series of years of 4½ to 5 per cent. The internal debt in 1890 was, with accrued interest, $3,547,997. The national money in circulation is all of silver, and amounted December 31, 1889, according to the Statesman's Year Book, to about $368,000, besides $780,758 deposited in the two banks at Guayaquil. There are two banks issuing notes for circulation, for which the Government is not responsible, which had a circulation in 1889 of $1,974,778 on a basis of silver deposits equal to one-third of that amount.

PHYSICAL CHARACTERISTICS.

Ecuador, like Peru, has a narrow and hot coast region of great fertility; a central area from north to south broken by the great double Andean chain and lateral branches, characterized by fertile and salubrious valleys of considerable extent, high table-lands best suited to pasturage, and timber, and snow-clad mountains containing considerable mineral wealth, many of which culminate in volcanoes; and on the east a region nearly four times greater than the others combined, abundantly and regularly watered, equally fertile, abounding in forests of valuable timber and economic plants, and suited when subdued to almost every agricultural use except the production of the smaller cereals. An article in the American Cyclopædia says, very truly:

No country in the world presents a more varied surface than that of Ecuador. About nine-tenths of it is composed of snow-clad mountains, dense forests, and vast llanos or savannas. To the east extend interminable forests and immense plains, intersected by rivers, lagoons, and marshes, and interrupted by mountain ranges stretching from the Andes obliquely to the banks of the Amazon. To the west the country is covered with extensive forests, with less lofty mountains, and cut by rivers of lesser magnitude. The center swells into two cordilleras separated by a valley 300 miles long, with snow-covered peaks ranking among the loftiest of the earth. The valley is remarkable as being, next to the basin of Titicaca, the center of the most ancient native civilization of America. The Andes enter the republic by the mountain knot of Loja, where they separate into two chains parallel to each other, and to the coast, traversing the State in a NNE. direction until the chain again unites in the mountain knot of Pasto, near the northern limit. At two points transverse ridges link the two parallel chains together, dividing the large valley into three smaller ones, named severally, commencing at the south, Cuenca, Alausi and Ambato, and Quito. * * * The elevation of the valleys varies from 8,500 to 14,500 feet, that of Quito having a mean elevation of 9,540 feet. * * * Nowhere in the whole system of the Andes are more colossal mountains than those on either side of the valleys of Quito and Ambato, 2° S. and 0° 15′ N. of the equator. Many of these are volcanoes, a few being extinct and the others in activity. * * * The country between the Andes and the Pacific is intersected by spurs detached from the western chain, and gradually sinking into low hills as they approach the coast, except the portion adjacent to the Rio de Guayaquil, which is a plain several miles in extent and so low as to be inundated during the flood.

SOIL AND CLIMATE.

The rock structure of the Andes appears to be principally syenitic and porphyritic, but trachyte is found in many of the important ridges and peaks of the mountains in Ecuador, while extensive tracts in and about them are covered with lava, pumice, and cinder. Much of the soil is decomposed from these elements, particularly in the volcanic regions and along the coast side. The soil of the lower portions of the country, especially towards Brazil, decomposed partly from the abundant vegetable growths, is alluvial to a greater extent and degree, with a mixture of detritus washed down from the more elevated areas.

As to the climate much can be inferred from the situation of the country under the equator, and from its topographical features. The snow line upon the mountains is seldom lower than 15,500 feet, according to the observations of Wagner, noted in the Encyclopædia Britannica, "while St. Bernard's, the highest point of permanent human habitation in Europe, is only 8,377 feet above the sea."*

Most of the towns and villages of the central plateau from Ibarri to Cuenca lie between 8,500 and 9,500 feet high, as has been noted of the valleys containing them, and cattle ranches are found 12,800, and one on the north side of Chimborazo 13,396 feet above the sea, the temperature being, of course, comparatively low. Prof. Orton states that "at Quito it is never either spring, summer, or autumn, but each day is a combination of all three." The thermometric mean is stated to be 58° 8′; range in the 24 hours, about 10°, annual maximum 70°, and annual minimum 45°.

In the lower coast region the tropical position of the country is the main factor, and accordingly at Guayaquil we find the thermometric mean is 83°, and during the rainy season the oppressive and pestiferous air "reminds the geologist of the steaming atmosphere of the Carboniferous period." The rainy season, or *invierno* [winter], in Ecuador continues from December to May, with a short period of dry weather called the *veranillo* [little summer], shortly after the December solstice. The rest of the year forms the *verano*, or summer, which, however, is in like manner interrupted by a little rainy season called the *inviernillo* [little winter], * * * after the September equinox. The mean annual rainfall at Quito is 70 inches. In the coast region the two seasons are not very distinctly marked. * * * On the east side of the Andes rain occurs at almost any time of the year, and almost every morning the woods are watered with the gentle showers of the *rocio*.†‡

There are but two seasons, summer and winter. The former, commencing in June and lasting till November, is the season of winds; and the latter, beginning in December and ending in May, is the rainy season. This regular succession of the seasons, however, is known only in the table-land between the mountains and on the plateaus along the declivities of the western Cordillera. Hail and snow storms are common in the elevated plains of the Cordilleras, and frost destroys the unripe cereals. The direction of the wind changes with the localities. In the great interalpine valley the prevailing wind is from the south, with an occasional norther, but in the more elevated regions the wind currents are almost constantly from the east,

* The same article, Ecuador.

† Very fine rain, or a shower.

‡ Encyclopædia Britannica.

sometimes increasing to terrific tempests. In the coast region the south wind prevails in summer and the north wind in winter. In the latter season the copious rains at the headwaters of the rivers cause them to inundate the surrounding districts. * * * The climate on the whole is salubrious, particularly that of the valley between the Cordilleras. Intermittent and other fevers are frequent in the coast region; but they are unknown in the highlands, and pulmonary consumption is rarely heard of. Elephantiasis is common at Quito.*

The mean diurnal variation of the barometer [at Quito] is only 0.084. So regular is the oscillation, as likewise the variations of the magnetic needle, that the hour may be known within 15 minutes by the barometer or compass. Such is the clock-like order of nature under the equator, that even the rains, the most irregular of all meteorological phenomena in temperate zones, tell approximately the hour of the day. The winds, too, have an orderly march—the ebb and flow of an aërial ocean. * * *

The greatest variations of the thermometer occur in autumn, and the greatest quantity of rainfalls in April.† While on the western side of the Andes, south of the equator, the dry season extends from June to January, on the eastern side of the Cordillera the seasons are reversed, the rain lasting from March to November. The climate of the central valley is modified by this opposition of seasons on either side of it, as also by the proximity of snowy peaks. Nine such peaks stand around Quito within a circle of 30 miles.‡

From the authorities here quoted, as correct an idea of the climate as can be conveyed in words is given; that is, in brief, that the climate is intensely tropical, modified in considerable portions of the country in the mountains and on the interior plains by elevation, topographical character, and prevailing winds, as well as by the equal length of night and day. But in all productive parts the country is never less than subtropical, and in those which at present contribute to foreign commerce they are altogether tropical, as the articles of agricultural exports or soil products show. Relative to domestic exports Ecuador is wholly tropical, like Brazil.

AGRICULTURAL AREA AND PRODUCTIONS.

How much of the nearly 263,000 square miles of area of Ecuador is available or is employed in agriculture is unknown, as the country has never been surveyed, except superficially, in parts, for railway routes, and there are no census or other returns published, and probably none taken, of cultivated lands. It is probable that a large portion of the eastern section of the country, which is well watered by tributaries of the Amazon and has an abundant and regular rainfall, is as well suited to agriculture as the similar and adjoining portion of Peru, described in the article upon the agriculture of that country. This eastern region comprises quite two-thirds of Ecuador, and is almost wholly un-

* American Cyclopædia.

† Mean annual rainfall at Quito, 70 inches; at Charleston, 45.9; at New York, 42.23; at Albany, 40.93; at Montreal, 36; at Madrid, 10.

‡ The Andes and the Amazon, by James Orton, 1870.

developed, as it has little civilized population and no improved connection with the world beyond. The million of more or less industrial population is mainly concentrated among the three principal mountain valleys and along the intervale west of the Andes drained by the Guayas River. The coast belt proper has few cities or towns, and the large and fertile region east of the Andes fewer still, compared with the mountain region or with their extent. In fact, Ecuador, unlike most of the countries of South America bordering upon either ocean, appears to be at a standstill as to increase of population or agricultural development, which are to a certain extent interdependent.

Relative to the productions of soil, whether spontaneous or cultivated, they are typically tropical for the greater part, including among food plants the banana, sweet potato, yam, mandioca, maize, rice, and between 6,000 and 10,000 feet above sea level chick peas, the broad-bean, cabbage, and cereals common to this country. Wheat will not ear below 4,500 feet. nor ripen above 10,500, but barley and rye can be grown at a greater elevation. Among the fruits are cocoanuts, pineapples, pomegranates, bread-fruit, shaddocks, oranges, lemons, limes, mangos, chirimoyas, apricots, granadillas, and many others. Coffee and cacao of excellent quality are grown, the comparatively small quantity of the former which is shipped reaching the market as "Old Government Java," and the latter ranking next to that of Caracas. There are three varieties of cacao grown, one of which is too rich in oil to keep beyond six months. Most of the productions named grow below an elevation of 3,000 feet, including cotton, of which considerable is raised for domestic use. Sugar cane is cultivated successfully up to a height above the sea of 8,000 feet. Besides the productions named, some of which, as the cacao and banana, often grow wild and too abundantly to be harvested by the sparse population, the forests produce cinchona, rubber gum, copal, dragon's blood, and several varieties of dyewoods, besides excellent textile fibers and rich woods.

Of the native useful animals which are fairly abundant, the llama, guanaca, vicuna, and alpaca are the principal. There are large flocks of sheep and herds of cattle pastured upon the rich grass of the paramos, or mountain plains, and horses, asses, and mules are raised in numbers sufficient for some exportation. Goats are also raised for domestic purposes, as in all Spanish and some other countries, their real value being appreciated. The numbers of the various farm animals are unknown, but from the export statistics it is apparent that they do not far exceed the current necessities of the population, and, indeed, the same may be said of many of the domestic productions, the commercial surplus of which is indicated under the succeeding head, as to articles and value, so far as can be shown.

FOREIGN COMMERCE.

Like most of the facts which relate to the activities and resources of Ecuador, the value of its foreign trade is difficult or impossible to determine, as its exports are included under the summary of trade "with all other countries" in some fiscal reports, and "there are no trustworthy estimates of imports"* as a whole. Resort must be had to the reports of such nations trading with Ecuador as publish detailed commercial statements, and those, in this instance, are Great Britain, Germany, and the United States, while France gives totals but no item values.

The Hand Book of the American Republics states the total imports of 1889 as $6,757,656 and the exports as $5,521,327 in value, the total being $12,278,893. The British consul at Guayaquil states the exports alone for that year at $8,832,000, and an increase over 1887 of $1,383,000, whereas the former authority shows a decrease in the total trade of over $3,000,000. The principal items of export are cacao, coffee, hides, rubber gum, and vegetable ivory. Spain is said to be the principal purchaser of the former, with Great Britain and this country next. The chief articles of importation appear to be cotton goods, breadstuffs and other provisions, and iron and steel manufactures. Of provisions the larger portions come from the United States, while Great Britain supplies the largest share of the other principal articles.

Whatever the volume of the foreign trade of Ecuador may be, that portion of it represented in the fiscal reports published by other countries was as follows for the year 1890, assuming that an earlier year, the latest data available, represents the average of French trade with the country, viz:

Imports.	Value.	Exports.	Value.
From Great Britain	$1,408,759	To Great Britain	$754,401
From United States	714,924	To United States	543,994
From France	582,494	To France	43,600
From Germany	335,580	To Germany	787,304
Total	3,041,757	Total	2,129,299

The aggregate of the trade with these countries thus appears to be but $5,171,056 out of a total, as variously claimed, of thirteen to fifteen millions; and the above is all for which statistics appear to exist, except such as may be unpublished, in the ports of the Republic and in Spain and minor countries. As the United States and Great Britain are acknowledged to have the largest trade with Ecuador, and as the reputed value of its total trade, compared with that of most other South American countries, is out of proportion to its population and industrial development as well as to the revenue derived from customs dues

* Statesman's Year Book, 1891.

on a high basis (revenue in 1889, $2,289,332, one-half from customs; rate of duties from 1.7 cents per pound, as on provisions, to 12.6 cents per pound, as on wool, average on dutiable articles 5.3 cents per pound, and an additional municipal tax of 20 per cent on the amount of the resulting tariff), it may reasonably be inferred that the value of the foreign commerce of Ecuador is considerably overestimated by the authorities quoted. With no great public works in progress and no remarkable public industries to stimulate exchange, and with a considerable public debt and interest in arrear, it scarcely appears probable, and lacks any demonstration, that the foreign trade of the country amounts to from $12 to $15 per capita each year. Two-thirds or less of that rate seems to be nearest to the known proof and to the apparent fitness of conditions.

The following tables show in some detail the character and value of the trade with the United States and Great Britain for the years indicated. In 1886 Ecuador did not appear by name in our published commercial reports, but its trade with us was included in the summary of values with unnamed countries, which amounted to only $933,283 in imports and $638,343 in exports:

Imports into Ecuador from the United States during the years ending June 30, 1888 and 1890.

Articles.	Value.		Articles.	Value.	
	1888.	1890.		1888.	1890.
Books and prints	$8,347	$4,375	Provisions:		
Cars and carriages	11,786	4,472	Breadstuffs, mostly flour	$32,297	$134,692
Chemicals and drugs	33,398	24,690	Meat products, mostly hog	168,430	205,194
Copper and brass manufactures	1,129	840	Dairy products	6,162	6,269
Cotton goods	169,027	48,767	Vegetables	492	185
Fancy articles	12,271	11,055	Rubber manufactures	5,800	3,049
Fish and oysters	10,873	7,007	Sugar and candies	2,123	418
Flax, hemp, and jute manufactures	13,419	12,256	Tobacco manufactures	553	151
Fruits and nuts	809	145	Wood manufactures	48,451	21,596
Instruments, scientific and other	6,136	5,919	Wool manufactures	5,756	370
Iron and steel manufactures	155,469	116,313	All other articles of agricultural origin	7,546	7,222
Leather manufactures	21,221	7,239	All other manufactured articles	73,454	64,064
Oils of all kinds	12,752	25,513			
Paper manufactures	2,966	3,123	Total	810,567	714,924

Exports from Ecuador to the United States during the years ending June 30, 1888 and 1890.

Articles.	Value.		Articles.	Value.	
	1888.	1890.		1888.	1890.
Free of duty.			*Free of duty.*		
Cacao	$530,634	$150,156	Other articles	$15	$875
Cinchona	413	...	Articles returned	2,779	1,544
Coffee	59,799	81,863	*Dutiable.*		
Drugs and dyes	1,077	844			
Goat skins	2,933	2,901	All articles	3,075	1,066
Hides	137,069	133,597			
Rubber gum	327,477	160,095	Total	1,118,427	535,060
Vegetable ivory	54,356	2,120			

Imports into Ecuador from Great Britain during the years ending December 31, 1886, 1888, 1890.*

Articles.	Value.		
	1886.	1888.	1890.
Bags and sacks	$27,632	$6,964	$39,302
Biscuit and bread	126,563	144,112	173,642
Cotton goods	750,872	986,235	756,872
Hardware and cutlery	21,627	42,626	15,967
Iron and other metals	97,181	246,196	183,973
Linen goods	35,068	25,515	33,145
Machinery and mill work	26,956	44,300	10,750
Rubber manufactures	10,950	11,607	10,371
Wearing apparel	17,237	34,781	18,006
Woolen and worsted goods	122,460	231,100	163,738
All other articles	1,708	8,852	2,993
Total	1,238,254	1,776,288	1,408,759

* Arranged from the British official trade reports.

Exports from Ecuador to Great Britain during the years ending December 31, 1886, 1888, *and* 1890.

Articles.	Value.		
	1886.	1888.	1890.
Cacao	$943,980	$456,054	$616,773
Caoutchouc	.....	14,536	1,818
Dyestuffs	11,714	3,747	1,352
Peruvian bark	46,782	43,215	36,178
Tobacco	389	638	13,967
Vegetable ivory	33,983	82,180	24,727
All other articles	62,272	43,750	59,586
Total	1,099,120	644,120	754,401

From the foregoing tables relative to the United States, it appears that our trade with Ecuador was less, both in imports and exports, in 1890 than two years before. Of the total amount of imports from us, amounting to $714,924, over 48.5 per cent, or $346,340, was in provisions, a gain in this item over 1888 of $138,959, while the decrease in other articles amounted to $234,602, apparently showing that our farm products have the surest hold on the market of Ecuador. The decrease of trade and increase in agricultural exports are the only noticeable features in this connection, except that of the 11,000,000 pounds of sugar annually produced in Ecuador, mostly in the region of Guayaquil, none reached this country.

IMPORT DUTIES.

The import duties upon such articles of agricultural derivation as are of interest in this connection are as follows, the value of the peso of Ecuador being represented by 73.6 cents United States money:

[Per pound.]

Articles.	Duty.	Articles.	Duty.
Butter	$0.0334	Raisins	$0.0167
Flour, of any kind	.0167	Rice	.0033
Fruits, dried	.0167	Sausages	.1669
Hay	.0033	Sugar	.0167
Hops	.0067	Tallow, rough	.0167
Lard	.0334	Tobacco, leaf	.3338
Maize	.0067	Tobacco, manufactured	.6677
Meats, salted	.0167	Vegetables, fresh	.0033
Oils, linseed, olive, etc	.0334	Wheat	.0067
Onions	.0033	Wines, in any vessel	.0343
Potatoes, sweet or other	.0033		

INTERIOR COMMUNICATION.

There are no wagon roads in this country outside of the near vicinity of cities, and all kinds of burdens are borne upon the backs of horses, mules, asses, llamas, and men. Most of the paths which answer for highways are impassable, especially with weight, during the rainy season, and at the best they are execrable. The mountainous nature of the country where population exists is partly responsible for want of good roads, but the character of the population itself has much to do with the matter.

The construction of railways was commenced in 1872, according to a report made by Mr. Caamaño to the International American Conference, but up to the time of the report in 1890, only 13.6 miles were in operation, with 62 miles finished upon another line. Several concessions have been granted and some work has been done, intended to connect Quito, the capital, with the coast, and to connect various interior cities. There is some navigation of streams in and east of the mountains, and of the Guayas, on the west side, great use is made.

The capital is connected with Guayaquil by telegraph, and altogether there are about 1,200 miles of telegraph lines. Through Colombia the country is connected with the world by ocean cables. By the postal system over three million letters and packages are transmitted per year.

LABOR AND SUBSISTENCE.

The largest proportion of the people of Ecuador are engaged in rural industries. Nearly all agricultural labor is under the peonage system, the laborers being in bond to continual debt. Peon wages along the coast side of the Andes are $8 per month, and in the interior $4. However, the labor of three peons is only equivalent to that of one man in most parts of the United States.

Laborers are given 12 ounces of meat, 14 ounces of rice or beans, and a little lard or salt per day. The usual clothing consists of three coarse shirts and three coarse pairs of pantaloons per year, costing about $6. A tenth of the products of agriculture go to the church.

In the cities common laborers are paid 75 cents per day; carpenters, $1.50 to $2; masons, $1 to $1.50; painters, the same; blacksmiths, $1 to $2; boat builders, the same; and porters, cooks, and men servants employed by the month, receive from $10 to $12, with board. Women servants receive $6 to $10, with board. Tailors, shoemakers, printers, bakers, barbers, etc., are paid from $6 to $12 per week. These are the wages in the coast provinces, while in the interior they are about one-third less.

Meats are 10 to 15 cents per pound in the cities; fresh fish, 5 cents; sugar, 10 to 15; rice, 5; flour, 10; meat, 5; coffee, 10 to 12; bread and crackers, 15, home cheese, 8; potatoes, 2; and onions, 3 cents per

pound. Plantains and yams, which are very cheap, are used largely as substitutes for potatoes, and fruit is plentiful and cheap. Little butter is used, imported costing 50 to 70 cents per pound. Large quantities of lard from the United States are used in cooking, and retails at 20 cents per pound. Kerosene sells at $1 per gallon. Prices, like wages, are lowest in the interior.*

EDUCATION AND THE PRESS.

There are in Ecuador 856 primary schools and 37 secondary, with about 60,000 pupils. Primary instruction is obligatory and gratuitous. There is also a university at Quito, and there are university bodies at Guayaquil and Cuenca, and military, technical, and commercial schools. The scientific school at Quito has 11 professors and about 50 students. By the constitution the national religion is Roman Catholic, and the schools have such limitations as that religion sanctions.

There are 17 journals published in the several cities, 2 of which are daily, 3 triweekly, 11 weekly, and 1 monthly. Their presses and type were made in the United States, but Germany furnishes the paper and most of the ink for their use.

CONCLUSION.

Ecuador, naturally one of the richest and most favored of countries, scarcely requires or permits a summary of its resources, which are mainly undeveloped; its advantages, which are apparent at a glance, but which it has not the population to utilize; or its industrial achievements and their impress upon the commodity exchange of the world, which are as yet but slightly appreciable. The stir of progress around it has scarcely awakened it from its dream of centuries. What it is now can to some extent be judged fairly, it is hoped, from what is herein presented. When it will become different by assimilating stronger progressive tendencies can not be predicted, but such an era is sure to come.

* Reports of Consul Beach to the Department of State.

THE GUIANAS.

The regions on the northeastern coast of South America forming the only European possessions on its main land are a portion of a larger region discovered by Columbus in 1498, and later given the name of Guiana, Guyana, or Guayana. The greater portion of the large region belongs to Venezuela and Brazil, the whole being included between the Orinoco and the Amazon, and has been included in the consideration of the agriculture of those countries under their respective heads. The colonial regions are known now as British Guiana, Dutch Guiana, and French Guiana, and pertain as possessions to the respective countries indicated by their names. They are of comparatively small extent and importance, and for purposes of this article may be treated together in many of their features. They are each under the administration of a governor and subordinate officers appointed by the home government, and the first two have local legislatures.

AREA AND POPULATION.

The Guianas extend along the Atlantic from about latitude 4° to 7° north, or from the River Oyapok to the Essequibo, but in the interior the southern limit reaches to less than a degree of the equator. From east to west the extent is from 51° to about 58° west longitude. The area of the respective possessions in square miles, as given in the Encyclopædia Britannica, and the population of the two latter as given in the Almanach de Gotha for 1891, are as follows:

Colonial possessions.	Area.	Population.
British Guiana	76,000	[1]252,186
Dutch Guiana	58,530	66,037
French Guiana	[2]53,000	[3]25,796
Total	187,530	344,019

[1] Statesman's Year Book for 1885.
[2] Rambaud, in "Colonial France," claims "about" 57,915.
[3] Of this population 4,400 are convicts in prison or liberated.

Since 1886 Great Britain has claimed and taken possession of 33,000 square miles, extending north to the mouth of the Orinoco, always previously in the possession of Venezuela and still claimed by that Republic, which area bears a population of nearly 30,000 inhabitants, according to the British calculation of 1890, in the Year Book for 1891.* The historic area stated in the foregoing table is 10,000 square miles greater

* See article on Venezuela *infra*.

than that of Spain, and 5,000 greater than that of the New England States, New York, New Jersey, Pennsylvania, Delaware, and Maryland combined.

COLONIAL FINANCES.

The estimated receipts and expenditures of British Guiana for 1890–'91, and the actual of the other colonies for 1889, as stated in the Almanach de Gotha and the Statesman's Year Book for 1891, may be tabulated in United States values as follows:

Colonial possessions.	Receipts.	Expenditures.	Excess or deficiency.
British Guiana	$2,554,912	$2,523,270	$31,642
Dutch Guiana	254,917	314,031	[1]59,114
French Guiana	206,866	427,648	[1]220,782
Total	3,016,695	3,264,949	[1]248,254

[1] Deficiencies.

The deficiencies of Dutch and French Guiana, which are of annual occurrence, are borne by the respective home governments, so that no standing debt is created. British Guiana had a public debt in 1889 of $3,588,555.

PHYSICAL CHARACTERISTICS.

The general appearance of the surface of the Guianas, from the coast line to the interior, indicates successive elevation of the land which has corresponding bench marks, showing former coast lines. The shore is also skirted by mud banks, the water on which decreases in depth shoreward, or by mangrove marshes, as in French Guiana, and there are bars of mud, quicksands, and rocks at the mouths of the rivers, so that much of the country is unapproachable to vessels of any considerable draft. The British colonial capital, Georgetown, has a mud bar under 8 feet of water at the mouth of its port; the French, Cayenne, has a shallow harbor; but the Dutch, Paramaribo, 5 miles up the Surinam River, which is there half a mile wide and 5 miles in width at its mouth, admits vessels of 18 feet draft, and is ample in every respect.

The flat coast lands of British and Dutch Guiana are on a level with the sea at high water, and generally extend inland many miles. Back of this extensive level the land gradually swells to an elevation of 200 feet, forming the northern edge of the table lands. This generally rising plateau is intersected by parallel ranges of hills, extending to the mountain ranges in the extreme south, which are highest towards their western parts, the loftiest eminence, Mount Roraima, reaching 7,500 feet.* This territory is drained by six large rivers and their numerous tributaries, the rivers being navigable in some cases for 100 miles.

Fully half of this extensive region is covered with a dense tropical forest, and nearly all with a luxuriant vegetation. About one fourth

*American Cyclopedia.

is comprised in meadow plains, where considerable herds of cattle and horses find pasturage, and the remainder is included in plantations, where the usual cultivated productions of the tropics flourish. Sugar, cotton, and tobacco are raised for export, and cacao and indigo to some extent, while over a considerable part of the country coffee grows wild. The soil is everywhere rich, with underlying sandstone or granite, and the scenery of the interior is remarkable for its beauty and occasionally for its boldness; one waterfall, 369 feet wide, making a single leap of 822 feet into the valley of the Essequibo, and one precipice of 1,500 feet from the flat top of a mountain being veiled in the waters and spray of numerous cascades.

CLIMATIC FEATURES.

Situated just north of the equator, and washed by the northward branch of the great equatorial current, the Guianas are necessarily intensely tropical, especially along the extensive low and marshy coast. The character of the heat of the South American tropics, where the earth is not generally arid, is usually misjudged by people not familiar with it and its effect. It seldom rises to the intensity there that it does in Washington or New York, and consequently sunstroke there is scarcely known; but it manifests its power through a generally high average, which varies little, compared with the variations in what are called temperate regions, between night and day, or between the various seasons. Therefore a uniformly hot climate may be a generally healthy one, requiring other coincident influences or causes to make it otherwise. Heat decreases with elevation with remarkable rapidity in the tropics, as surely as elsewhere also; so that, while geographically equatorial, a climate may actually attain or lose any known degree of temperature measurement.

Naturally, perhaps, as the coast and river regions of the Guianas and of South America generally contain the larger part of the civilized population, reports of climate and its effects are in great part confined to them; and these regions of greatest heat, low elevation, stagnant waters, and rapidly growing and decaying vegetation give untruthfully their naturally bad character to more extensive and naturally salubrious interior or adjoining ones. It is true that the coast of the Guianas is hot and unhealthy, with little exception; and it is equally true that back from the lowlands the climate is agreeable, even delightful, and favorable to health. This rule applies to the most of Spanish America.

Of British Guiana the Encyclopædia Britannica states that—

> the climate, especially in the interior, is healthy. The even temperature is considered suited for pulmonary complaints, and tubercular consumption is unknown. * * * The thermometer seldom rises above 90° or falls below 75° F. At Georgetown the mean annual temperature is 81.2°.

The average annual rainfall for the five years ending with 1877 was 74 inches.

Of Surinam, or Dutch Guiana, the same authority states that, though

the climate is moist and hot, "like a Turkish bath," it seems to agree with European constitutions. The mean annual temperature is 80.4° F.; the mean of the coldest month is 78° and of the hottest 99°. The average rainfall for eight years at various points was as follows: Paramaribo, 101 inches per year; Gelderland, 108; Groningen, 91; Nickerie, 67, and Monbijou, 129.

M. Alfred Rombaud, in "Colonial France," gives the mean annual temperature of French Guiana at 28° C. (82.4° F.), the maximum temperature at 31° (87.8° F.), with rare exceptions, and the minimum at 23° (73.4° F.). This statement coincides substantially with that of the work before cited. He states also that the annual rainfall is from 3 to 4 meters (118 to 157 inches), and that the rainy days number 160 to 180 in the year.

In all the Guiana region there are the two tropical seasons, the wet and the dry, with some variations, as in other similar regions, which give to the generally rainy season a little time of abatement, and to the generally dry one some days of rain.

AGRICULTURAL AREA AND PRODUCTIONS.

It would not be far out of the way to say that nearly all of the area of the Guianas is suited to agricultural utilization, for the low lands inundated by the sea have been partly reclaimed by a system of dikes, and may be still further to a much greater extent, and form the richest sugar plantations. The interior, upon the hill and mountain sides, is suited admirably to coffee culture, even where it is useful for little besides, and the proportion of waste land is not excessive. But, like the most of South America, this naturally prolific region is nearly all undeveloped, especially in the portion pertaining to France, which has no present industrial significance, except that which pertains to a small penal colony.

In 1889 British Guiana had 81,660 acres in cultivation, of which 78,110 were in sugar cane, and there were in addition 12,833 acres in villages, and ninety-two cattle farms. In 1888 Dutch Guiana had in cacao plantations 21,712 acres, and in sugar 4,120. This area was divided into 470 large and small properties. The whole area definitely reported in the two colonies as under cultivation was therefore only 120,325 acres, including village areas, or 188 square miles, or a little over one-thousandth part. There was, however, some land in Dutch Guiana devoted to bananas, rice, coffee, cotton, fruit, etc., not specifically accounted for. The field and forest productions of the Guianas, it has been stated, are those of the tropics in all their varieties. The principal articles are shown under the classification of exports.

FOREIGN COMMERCE.

The trade of French and Dutch Guiana is not separately stated in the commercial reports of the home governments. In the first it is unimportant and in the last the exports are nearly all of cane products.

The American consul states the production of sugar to have been as follows in Dutch Guiana for three years: In 1884, 16,181,172 pounds; 1885, 11,976,016 pounds; 1886, 15,395,751 pounds. The amounts exported to various countries in 1886 were as follows, according to the same authority:*

Destination.	Muscovado.	Vacuum pan.	Total.
	Pounds.	*Pounds.*	*Pounds.*
Holland	815,762	928,084	1,743,846
Great Britain	285,186	5,773,792	6,058,978
North America	2,435,202	496,786	2,931,988
All other places	32,634	705	33,339
Total	3,568,784	7,199,367	10,768,151

Of the amount destined for North America, according to our own official reports, the United States received 1,976,587 pounds, valued at $40,837. In 1886 363,000 pounds of sugar, 263,000 refined, were imported into Dutch Guiana. At the rate per pound of the sugar imported from that colony into the United States, according to the amount and value above given from our Treasury report, the total value of the sugar shipped, as per the foregoing table, was only $2,224,700. In 1888 the trade with this country had fallen to a low figure, which now is gradually increasing, but still cacao leads sugar in an increasing amount in the exports to us.

The British consular reports for 1891 state the total export of Dutch Guiana in 1890 at $1,721,816, the imports at $2,173,763, and the total trade at $3,895,579, and that this was an increase over the previous year. Imports from the United States were mostly of provisions and lumber.

Relative to the foreign trade of British Guiana, the following table from the British trade reports shows the value by leading articles for a series of years:

IMPORTS.

Articles.	1885.	1887.	1889.
Butter	$123,337	$112,942	$92,264
Coals	255,662	448,540	425,867
Flour	622,450	547,068	668,151
Fish, dried	251,710	248,279	302,979
Lumber	123,921	160,658	187,545
Machinery	224,779	308,429	682,493
Malt liquor	103,306	128,656	123,974
Manure	345,896	338,621	440,754
Oils	161,592	160,784	168,760
Opium	55,726	47,195	39,340
Pork	279,181	226,409	276,850
Rice	1,086,616	993,039	985,870
Spirits, brandy	53,313	53,945	50,003
All other articles	3,453,536	4,027,291	4,333,231
Total	7,141,015	7,801,856	8,778,081

* No. 86, Consular Reports.

EXPORTS.

Articles.	1885.	1887.	1889.
Molasses	$168,434	$218,579	$326,440
Rice	222,292	145,980	223,212
Rum	1,007,696	680,526	815,737
Sugar, raw	6,752,532	8,772,786	9,346,342
All other articles	612,751	842,645	1,314,364
Total	8,763,705	10,660,516	12,026,095

The following table, from the same source, with amounts reduced as above from pounds sterling to dollars, shows the distribution of this trade:

IMPORTS.

Countries.	1885.	1887.	1889.
United Kingdom	$3,526,611	$4,459,738	$5,114,779
British Possessions:			
West Indies	242,415	158,536	329,628
Other Possessions	1,398,184	1,289,301	1,111,158
United States	1,680,607	1,542,783	1,953,754
Other foreign countries	293,197	351,498	268,762
Total	7,141,014	7,801,856	8,778,081

EXPORTS.

United Kingdom	$6,295,368	$5,586,684	$6,410,407
British Possessions:			
West Indies	313,583	155,266	291,761
Other Possessions	118,558	234,755	229,713
United States	1,500,717	3,960,226	4,296,175
Other foreign countries	535,480	723,585	798,038
Total	8,763,706	10,660,516	12,026,094

The following table shows the commerce of the Guianas, separate and total, with the United States, according to the official reports of this country, for the years named ending June 30:

Year.	French Guiana.	Dutch Guiana.	British Guiana.	The three colonies.
1888.				
Imports	$140,086	$264,096	$1,651,711	$2,055,893
Exports	12,424	430,983	2,822,382	3,265,789
Total	152,510	695,079	4,474,093	5,321,682
1889.				
Imports	140,768	254,626	1,643,249	2,038,643
Exports	13,366	460,243	4,526,181	4,999,790
Total	154,134	714,869	6,169,430	7,038,433
1890.				
Imports	154,859	273,203	2,011,122	2,439,184
Exports	17,647	574,114	4,326,975	4,918,736
Total	172,506	847,317	6,338,097	7,357,920

Nearly all the values in the imports shown above were in field were forest products, and of the exports, in sugar, especially from British

Guiana. The decrease of exportation of coffee and increase of that of cacao from Dutch Guiana to the United States keep pace with similar changes in production there.

CONCLUSION.

The naturally fertile and considerable region of the three Guianas has been and is likely to be slower in development than others of South America not dependent upon foreign centers of government. Larger than either Ecuador, Paraguay, or Uruguay; more accessible by thousands of miles to the trade of Europe and North America than either of those countries, and possessing equal though partially dissimilar advantages for soil production; still, divided and dependent, it exhibits none of the enterprise of the age or of adjacent nations. Under such conditions, which are likely to continue indefinitely, with so little to offer to progressive people, it is doubtful that industrial enterprises could continue there without Asiatic and convict labor, and the remnant from times of slavery by which it dubiously profits. In the new world the three Guianas are political and social anomalies.

PARAGUAY.

The free intercourse of the little Republic of Paraguay with the world only began in 1845. Before that time, from the date of its settlement in 1536 to that of its independence, declared generally in South America in 1811, the country was dependent upon Spain for its commerce; and after its independence was accorded, rather than won by itself, it was closed against intercourse with all the world, under the rule of dictators who made the whole population their serfs, and imprisoned foreigners who ventured into their monarchy.

Upon the death of Francia, dictator from 1814 until 1840, consuls were elected as rulers, until, in 1845, Lopez was elected President. Though practically a dictator also, he pursued an enlightened policy in which an American, Edward A. Hopkins, assisted very much, and by which the country was opened to commercial and other intercourse, and American capital introduced in considerable amount for the development of important industries. The success of the United States and Paraguayan Navigation Company was so great, however, that it excited opposition from the Government of Paraguay without securing protection from the United States, and its property was confiscated, its business destroyed, and the lives of its promoters imperiled. Whether a result to some extent or not of this failure, the commerce of the United States with Paraguay is now insufficient to be represented by figures or mention in official reports.

In 1862 President Lopez died and was succeeded by his son, whose course involved the country in 1865 in war with Brazil, the Argentine Republic, and Uruguay, which lasted five years and nearly destroyed the little nation, apparently, as among its results was the destruction of all its industries and most of its personal property, the reduction of its territory, and the death in battle and by privation of more than two-thirds of its inhabitants, besides the occupation of its territory until 1876 by Brazil. But other results have been, the succession of a constitutional republican government, the sale of large tracts of Government and private lands which are being opened to development, colonization to some extent, the promotion of education among the people, and of industrial enterprises generally; so that for the first time in its history Paraguay appears in reality to have entered upon and to have made commendable progress in a course beneficial to its entire civilized population, and which makes its development and intercourse harmonious with the advance of the neighboring nations. This brief sketch of

its political history is explanatory of its present industrial condition and consequent unimportance, considering its natural resources, in the current commerce of the world—a situation not likely to remain unchanged, for reasons which will incidentally appear herein.

AREA AND POPULATION.

At the close of the war previously mentioned, in 1870, a survey of Paraguay was made which showed its extent, and to some degree the character of the lands, as follows:

	Square miles.
Arable lands	42,600
Mountain and forest lands	27,000
Yerba maté (Paraguay tea) lands	5,040
Total government lands	74,640
Private lands	15,360
Total area *	90,000

In settling the terms of peace, however, after the fierce Paraguayan war, 1,329 square miles of territory were ceded to Brazil, and what now constitutes the Argentine province of Bermejo, having an extent by map measurement of 30,000 square miles, was given up to that Republic, making a total loss of 31,329 square miles, and leaving as the reduced area of Paraguay 58,671 square miles. Since 1870, however, about 15,625 square miles by map measurement of the "Gran Chaco" country, claimed by the Argentine Republic, have been awarded to Paraguay by the arbitrator, then President Hayes, and the present extent of the country consequently appears to be about 74,296 square miles, an area nearly equal to that of Nebraska. Still, authorities differ as to the extent of the area. The Statesman's Year-Book for 1891 estimates it at 91,970, and the Almanach de Gotha at 97,721 square miles, while United States Consul Baker, long resident at Buenos Ayres, estimates it at "about 10,000 square leagues;" which, if Argentine leagues are meant, of 6,677 English acres to the league, would be 104,328 square miles, or if English leagues, 90,000, the amount under the survey of 1870. Still another authority, Mr. Theodore Child, in his recently published "Spanish-American Republics,"† makes statements which in figures would place the area at over 150,000 square miles. Considering the derivation of the first estimate of the present area herein given, it appears to be the nearest correct.

Whatever its extent, Paraguay lies in the interior of southern South America, a thousand miles from the sea to its center, with Bolivia and Brazil on the north, the latter on the east also to some extent, and the Argentine Republic extending the rest of the distance around it to the north line. It is separated from all these countries on its eastern,

* Consul Hill, in Consular Reports No. 104, of April, 1889.

† Argentine Republic, Chile, Paraguay, Peru, and Uruguay only are treated.

southern, and western lines by the rivers Paraná, Paraguay, and Pilcomayo, which constitute its means of communication, through the La Plata in the Argentine Republic, with the Atlantic. Like Bolivia, it is wholly devoid of seacoast.

The population of Paraguay in 1866 was estimated to be from 770,000 to 800,000. In 1876, about five years after the war, a census showed it to be 293,844; but this number appears to have been excessive in view of an admitted increase, and of the detailed figures of the census of 1886. The latter shows the population by departments, as furnished to the Department of State by Consul Hill, to have been as follows:*

Department.	Population.	Department.	Population.
Arroyos y Esteros	13,615	Santa Rosa	9,419
Ajos	5,631	Villa Concepcion	10,902
Capiatá	14,409	Villa del Pilar	14,392
Carapeguá	15,344	Villa Encarnacion	6,548
Ibicuy	7,080	Villa Rica	10,733
Ihacanguazú	12,501	Villa San Pedro	12,024
Itacuruby	12,046	Villeta	4,353
Mbocayaty	9,340	Yuty	9,736
Limpio	16,360	Asuncion[1]	25,724
Piribebuy	8,902		
Piruayú	10,089	Total	239,774
Quiindy	10,686		

[1] Consul Hill does not state the population of the capital, but gives the departments and the total as above.

The number of males shown in the last census was 100,262, and of females, 139,512, an excess of 16 per cent of the latter, due principally to the loss of males in the war; but not wholly so, according to the church records of births cited by Mr. Child, as showing an excess of female births per year in Asuncion of 4.8 per cent, and in the country districts of 9.28 per cent. "Paraguay," he states, "is the only country where the women are in the majority." There has been some immigration since 1886, and a natural increase in the population, which Consul Hill estimates to be altogether, in 1890, 300,000.† In addition to the civilized population, the Government estimates an Indian population in the Chaco region and another on the eastern frontier to aggregate 100,000.

A very large part of the civilized inhabitants of Paraguay are principally of Guaraní Indian stock, tinctured with the blood of the conquering Spaniards, and sometimes also with that of the Africans once held as slaves. There are a few families that boast of pure Spanish lineage, and about 3,500 Europeans in the country, mostly Germans and Italians. But the body of the people speak only the Guaraní language, which presents a unique obstacle to business or other intercourse with them. Whatever progress is made in this direction must be made through the good offices of the comparatively few Spaniards, who, like

* Consular Reports, No. 104, April, 1889.

† Mr. Child gives a higher estimate, as does the Hand Book of the American Republics, but without indicating reasons or bases.

very many of that race in South America, are proficient in several languages. As it is only forty-six years since the people of Paraguay were permitted to have intercourse with other people, and only twenty-one since that intercourse became practically free, and as they are still less in number and in wants that appeal to foreign commerce than most communities, it is not in them that particular interest centers, but in what their country ultimately promises to other peoples, in conjunction with the fertile and accessible greater region of which it forms a part.

GOVERNMENT AND CONDITION.

By the constitution proclaimed on the 25th of November, 1870, Paraguay has theoretically a form of government more like that of the United States than have many of the neighboring republics. The executive power is in the President, who is assisted by a cabinet of five ministers. The President and vice-president are elected for a term of four years, but by the Congress instead of an electoral college, and are afterwards ineligible for two terms. The Congress consists of a senate and house of deputies, members of the senate being elected for six years, one for each 12,000 inhabitants, and of the house for four years, one for each 6,000 inhabitants, all directly by the people. In the Congress is the sole legislative power. The judiciary consists of a supreme court with three judges, and courts of inferior jurisdiction.

For purposes of interior administration the country is divided into departments and districts, which are under chiefs appointed by the President, and have civil justices and boards of commissioners. By this arrangement, similar to that in Peru, Chile, etc., the Government is strongly centralized, and the national administration may interest itself closely with all matters of local concern.

The public revenue for 1889–'90 was officially stated to be 4,124,764 pesos, and the expenditures 4,252,797. As the peso is equivalent in value to 73 cents of United States money, the sums are respectively $3,011,077.72 and $3,104,541.81. The revenue is mostly derived from customs duties, which are levied both upon imports and exports. Considerable has been realized also at times from the sale of the maté plantations or herbales, and other public lands.

The external debt, greatly reduced since the war by an offset of large tracts of Government lands, amounted on the 1st of January, 1890, to 23,521,544 pesos, or $17,170,727.12, "including the consolidated English debt annuity of £844,050,"* or $4.107,569.33. The internal debt is small.

Of the few banks, the National, patronized by the Government, had a circulation on the date of May, 1889, of bank notes of the value of $721,978, and its accounts balanced on October 31 at $3,266,006.86. The Commercial showed a business of the year to March 31, 1890, of $1,451,852.47. The Agricultural Bank, established in 1888 for the accommodation of agriculturists, is not so successful.

* Statesman's Year-Book, 1891.

MENTAL AND RELIGIOUS INSTRUCTION.

Primary instruction has been compulsory, where practicable, since 1881, and schools are supported by special tax since 1888. There were 138 schools in 1887 with over 15,000 pupils, and in the next year 160 with nearly double the attendance. Commendable progress is being made in this respect, as in most of the Latin-American countries. There are a national college and an academy for girls in Asuncion; a public library, several daily papers, and an illustrated monthly. The established religion is Catholic, but other religions are permitted.

PHYSICAL FEATURES.

Generally speaking, Paraguay, with southeastern Bolivia, southwestern Brazil, Uruguay, and a considerable portion of the eastern part of the Argentine Republic, forms the second great interior area characterized by inconsiderable elevation above sea level, by alluvial soil, and by abundant water courses with great navigable extent or possibilities. The region of which it is an intimate part, like that of the much larger one of the Amazon basin, is practically undeveloped, with a population of about three to the square mile, but principally located in and about the cities and towns; yet comparatively small portions of it have been under the control of civilized man for four and a half centuries. Paraguay, as to situation relative to navigable bordering rivers and distance from the sea, has been aptly compared with the State of Illinois.

The eastern side of the country is much higher than the western, and has a chain of high land running southward through it, but nowhere rising much above 2,000 feet. The northern part of this elevated land is a continuation of the southern Brazilian plateau. There is also a mass of elevated land in the west, but in no part of Paraguay are there such distinct mountains as in central Bolivia. The general level of the lowlands of the west, including the Chaco region, is stated by Consul Hill to be from 250 to 300 feet above sea level, and above, to the rounded or level heights of the uplands, is found the present and possible agricultural area. In the southeast there are also *esteros*, or swamp lands. Mr. Child states, in his work already cited—

> Paraguay proper is not a mountainous country, but its surface is very undulating and traversed by various hill chains, whose summits do not exceed 500 meters (1,640 feet). The lines of the landscape are always soft and harmonious; there is nothing severe and somber; and the general character of the landscape is charming, and often so pretty and perfectly composed that it suggests the work of a clever scene-painter. With the exception of parts of Peru, Paraguay, from the point of view of scenery, impressed me as the most beautiful and charming country that I saw south of the equator. The interior of Paraguay is still little known to geographers. The northern and eastern parts are covered with immense virgin forests, which present an impenetrable obstacle to travelers. Except in the valley between the towns of Asuncion and Villa Encarnacion, and except certain roads opened across the forests of yerba maté, there are very few means of communication by land. * * * The valley of the Paraná is quite as fertile as that of the Paraguay, but it has been neglected in modern times because it is not easy of access. * * * The Chaco is, so to speak, land

in formation; exeept at a few isolated points it is exposed to inundation every time the rivers rise. The ground being flat the rain and flood waters do not run off, but dry up only by evaporation.

SOIL AND CLIMATE.

The soil of Paraguay, in the parts now principally settled, is generally richly alluvial or, in some places, of disintegrated red and other sandstone, rocks of this character appearing conspicuously along some of the rivers in successive lines of bluffs, as if they formed an extensive underlying stratum which exhibits itself less conspicuously but distinctly, according to Agassiz, far up the Amazon, though the characteristics of both regions are of the Tertiary formation. In Paraguay there are no disintegrations of a volcanic origin. The immense forest growth is evidence as truly of the kindness of the climate conditions as of fertility of soil, and all evidence shows that these combine to stimulate vegetal and agricultural production almost incredibly, as will hereafter be shown.

As to climate, the most of Paraguay lies north of the southern annual isotherm 70, and is thus in the torrid zone, although the southern boundary is fully 3°, or about 200 English miles, south of the tropic of Capricorn. In other words, Asuncion has a higher mean annual temperature than Lima, which is nearly 1,200 miles nearer the equator. Without pausing to explain this interesting but easily intelligible fact, it is here sufficient to state that a series of observations covering many years, made by Mr. Henry Mangels, German consul at Asuncion, who is approved by several authorities, shows the average annual temperature there to be 75.85° F. Mr. Child states, upon the authority of Mr. Mangels, that the thermometer varies during the summer months (there) of December, January, and February from a minimum of 55.4° or 57.2° to a maximum of 100.4° (C., 13°, 14°, and 38°), while in July, or midwinter, it ranges from 41° at night to 86° in the daytime (5° and 30° C.).

The summer heat is not torrid, but is tempered by frequent storms. * * * September and October are generally rainy, but there is no fixed rainy season such as we find further north in the tropical zone. On the whole, the climate of Paraguay is considered healthy, and during nine months out of the twelve it may be characterized as temperate.*

Mr. Mangels gives the annual and average rainfall at Asuncion for nine years as follows:

Year.	Inches.	Year.	Inches.
1877	58.2	1883	45.1
1878	102.9	1885	52.6
1879	62.4	1886	50.2
1880	62.0		
1881	65.7	Average	61.8
1882	57.4		

*Child.

In the seven years from 1877 to 1883 the average per year of rainy days was 79, of cloudy 72, and of clear 214. On an average there are ten frosts per year, and ice sometimes forms in the country. In June, 1888, the thermometer registered 36.9° F. at Asuncion.* These records of temperature and precipitation compared with those of Key West, Fla., in a corresponding latitude, for the six years ending in 1859, show that at Asuncion the average precipitation was over 26 inches greater and the temperature 1.09° less.

AGRICULTURAL PRODUCTIONS.

The two principal productions of Paraguay which enter into commerce, although of field growth, are not agricultural in the usual sense that they are dependent upon cultivation. They are *yerba maté*† and oranges, and are found growing freely without attention over large areas, although oranges are also planted around every homestead, unless found conveniently bestowed by accident.

Maté is a native tea made from the leaves of a tree or large shrub having the general appearance of the orange tree, which grows over considerable portions of Paraguay, Brazil, and the Argentine Republic, though most abundantly and of the best quality in Paraguay. It does not flourish under cultivation; and as its limits have been abridged in other regions by overcropping the product, its value has increased where it is regularly used, such use being confined principally to the southern portion of South America. The production of maté in Paraguay per year is estimated by Child at 24,200,000 pounds, over half of which is used at home, according to the record of its exportation. It seems impossible, however, that a quarter of a million people, or little more, should consume 56 pounds per head of this tea annually—that is, nearly 2½ ounces each per day—until we are assured on all hands that it is an almost hourly beverage for all classes, to the extent that protest is made by the press that its use is so frequent in public offices as to seriously interfere with the current government business.

The following is a statement from official records of the amounts of maté exported during the years named, and of the values. The article is sold at home for $2 per arroba of 25 pounds, and in Buenos Ayres at $3.50 to $5.50 per arroba:

Year.	Pounds.	Value.	Year.	Pounds.	Value.
1881	12, 421, 900	$434, 767	1884	14, 587, 025	$510, 546
1882	12, 959, 525	453, 583	1885	12, 338, 275	431, 840
1883	15, 570, 025	544, 951	1886	11, 073, 500	387, 573

* Vide report of Consul Hill, Consular Reports, No. 104.

† Yerba, herb, a generic name for all the smaller plants; maté (pronounced mah-tay), the leaves of a shrub of that name used in South America as a substitute for tea.—*Valesquez.* Yerba, a name generally given to all small plants; maté, a species of wild tree of Paraguay.—*Campano.* Botanic name, *Ilex paraguaiensis.* Guarani, *caá mi.*

The orange is understood to have been introduced by the Jesuits, and the seeds to have been widely distributed by birds. "The orange has spread all over the country, from the river banks to the tops of the hills, and from the cottages even to the deepest solitudes of the virgin forests. Paraguay is the land of orange trees." Mr. Child states in 1890: "Whether wild or cultivated, orange trees abound, and spread over the landscape a warm golden tinge of singular intensity. And what oranges! Juicy, perfumed, and of a delicacy that Spain and Italy have never attained." From May to August this fruit is shipped in heaps upon the steamers from ports along the Paraguay River to the number of about 60,000,000; as many more are consumed at home, and far the largest amount rots upon the ground, often in heaps also, and is destroyed by birds and monkeys. Shipments have increased since 1886, the shipments for six years up to that date being as follows:

Year.	Number.	Value.	Year.	Number.	Value.
1881	23, 958, 850	$33, 542	1884	27, 275, 000	$38, 185
1882	15, 761, 600	22, 066	1885	30, 056, 300	42, 079
1883	24, 182, 200	33, 855	1886	32, 482, 500	45, 364

Tobacco flourishes in Paraguay, yet no great amount is raised for exportation. Its use by all the people—men, women, and children—is as common as that of maté. The quality is superior, but the manner of curing does not commend it to foreign demand. The official amounts and values of the exports for a series of years are as follows:*

Year.	Pounds.	Value.	Year.	Pounds.	Value.
1881	8, 400, 750	$470, 442	1884	3, 146, 525	$176, 205
1882	5, 120, 675	286, 759	1885	5, 358, 100	300, 054
1883	7, 258, 800	406, 493	1886	10, 400, 150	582, 408

Sugar cane is grown in considerable quantity, and produces abundantly and with little care, the stand lasting from five to fifteen years without replanting. The product is mostly made into rum for home consumption, so that Paraguay imports sugar. No reliable estimate of the area in cane can be ventured.

Not further to particularize concerning the productions of the soil of a

*The Hand Book of the American Republics states the exports of tobacco at 7,000,000 kilograms, and of cigars at 25,000,000 kilograms, a total of 32,000,000 kilograms, or 70,547,200 pounds a year. The Statesman's Year Book for 1891 states the area in tobacco to be 16,300 acres. The yield per acre, therefore, without taking account of the tobacco reserved for home use, may be deduced to be 4,322 pounds per acre. Considering the fertility of the soil, and favorable nature of the climate of Paraguay, this yield need not be assumed to be impossible; but as the highest average yield in this country, for a period of ten years, was in New York, and amounted to only 1,340 pounds per acre, with excellent cultivation and abundant fertilizing, it seems on all accounts to be more reasonable to credit the official figures of export.

country whose contributions to the markets of the world are at present so insignificant, it is rather interesting to ascertain what are its easily available possibilities. An unusual proportion of its soil seems destined for agriculture and pastoral use, as it is neither mountainous nor rough. The higher portions, suited to maté, appear to be also suited to coffee culture. What the possibilities of its valleys and river bottoms are may be fairly estimated from the statements of an excellent authority, Signor William Godio, the Italian explorer of Africa and of the Plate basin.

After a second extended survey of the latter region, including the Paraná or eastern portion of Paraguay and adjacent parts of the Argentine Republic, that enlightened and able observer and investigator of new lands and conditions made an address before the Geographical Society and people of Buenos Ayres, on the 22d of January, 1886, in the Theater Colon, in which he said of the productions of the region indicated, among other things, as follows:

One thing alone is fixed in my mind, so that it absorbs and astounds me; it is the fertility of the soil. * * *

And, in truth, how shall I be able to make them believe, in my country, where at present the grape fruits after five years, that I have seen with my own eyes grapes hanging from shoots planted one month before; that I saw grapes gathered from shoots grafted only a month before; that one sole vine yielded 20 arrobas (25 pounds to the arroba) of grapes; that the vine bears abundantly twice per year; that I have seen in Posadas a garden, no larger than the auditorium of this theater, planted in grapes, from which its owner, a Frenchman, had gathered in one year 3,000 frascos of wine (5 pints to the Argentine frasco, or, total, 1,875 gallons)? * * *

Who will believe me when I say that I have seen mandioca of over 3 meters (9.84+ feet) height?

Who will believe me when I say that they obtain from the soil of Misiones yams of 30 pounds' weight; that tomatoes and peppers are perennial plants and bear all the year?

Who will give me faith when I state that they cultivate sugar cane and rice there without irrigation, given abundant night dews; that I saw stools which raised as many as 30 fat canes, and that 2 pounds of maize planted produced 15 arrobas; that one alquiere, or about 64 pounds of maize, gives a product of 800 to 1,000 arrobas; that 1 hectare (2.2 acres) planted to sugar cane renders, on an average, 15,000 arrobas; that maize yields two crops per year; that French beans yield three crops per year; that rice is harvested at four months from sowing, and that after cutting the first crop the same plants produce a second crop the same year? * * *

But Misiones is not as far off as the Promised Land, and any one can test the truth of my assertions easily by a little excursion, which, under any circumstances, will be useful, agreeable, and instructive.

These statements were made to people who can at any time take a commodious modern steamer and reach Posadas or Misiones after a pleasant river trip of 400 miles, little more or less.

CATTLE AND STOCK RAISING.

At the close of the war of 1865–1870 the number of cattle left in Paraguay was reckoned at 15,000 head. Previous to the war cattle-raising was a leading industry, but sheep-farming has not been found profitable

in so hot a climate. There were in 1886 but 32,351 sheep in the country. The census of stock for that year and the year 1877 is given by Consul Hall, in his very full and careful report, before cited, from official data, as follows, showing the increase in ten years:

Description.	1886.	1877.	Increase.
Cattle	729,796	200,525	529,271
Horses	62,386	21,140	41,246
Mules	1,925	1,299	626
Sheep	32,351	6,668	25,683
Asses	2,239	1,500	739
Hogs	12,250	3,026	9,224

As British and Argentine companies have purchased thousands of square miles of land in Paraguay within a few years past it is probable that cattle-raising will increase more rapidly.

MEANS OF COMMUNICATION.

An extract from the recent work entitled "The Spanish-American Republics" shows clearly the scarcity of interior means of communication. Paraguay was the first country of South America to build a railway, and it had a line in operation in 1865; but little progress in railway-building has since been made, the old line, 45 miles long, from Asuncion to Paraguay, having been continued a little over 44 miles, to Villa Rica. There are concessions for roads to reach the Atlantic through Brazil and to connect with the Bolivian roads, having a terminus through Chile on the Pacific. Most of the active population is located along the Paraguay River, and communication along that stream and with Buenos Ayres and Montevideo is frequent by excellent steamers and by sail, as also by the Paraná. Many tributaries of both rivers also are navigable.

About 3,000 sailing vessels and 500 steamers enter Paraguayan ports during the year, representing over 100,000 tons' capacity. "The United States flag is unknown in this part of the world" is the unnecessary assertion of our representative there.

FOREIGN COMMERCE.

All the trade of Paraguay with transatlantic countries is done through Buenos Ayres and Montevideo, and the destination of its exports is therefore unascertained in many if not most cases. Reports of its commerce are only up to 1889 and are as follows:

Year.	Imports.	Exports.
1881	$842,800	$1,349,600
1883	667,153	1,236,520
1885	1,066,800	1,045,100
1887	1,499,481	1,403,927
1889*	2,093,000	1,204,000

* Amounts for this year from Almanach de Gotha, in round numbers. Others official, reduced to United States values.

Nearly half the imports are from Great Britain. France, Italy, Germany, Spain, Belgium, and a few South American countries are also represented. The character of the goods required by the Paraguayan people can be judged from the following statement of articles and their values, imported in 1886:

Description.	Value.	Description.	Value.
Cotton and woolen	$473,511	Drugs	$19,302
Eatables	181,539	Furniture	10,128
Wines, liquors	165,098	Lamps	1,991
Mercury	67,387	Firearms	5,842
Hardware	58,831	Watches, clocks	780
Hats	38,065	Musical instruments	3,410
Shoes	15,710	Leather	3,967
Confections	21,679	Saddlery	5,906

Whatever trade there may be indirectly between Paraguay and the United States, by way of Buenos Ayres or Montevideo, there is no record of it in our trade returns. The only intercourse between the two countries is official.

CONCLUSION.

The area of the basin of the La Plata and its tributaries, which Paraguay represents and is an interesting portion of, amounts to about 1,375,000 square miles, and is second in South America, as hitherto stated, only to the somewhat similar basin of the Amazon. Together they aggregate considerably more than 3,000,000 square miles, of exceedingly interesting character in themselves and in most of their details, but particularly so in their certain development of valuable resources and productions desirable or necessary for portions of the world, like the United States, having a different climate. Our interest in these regions will augment steadily with their development; and hence the necessity of early, continuous, and accurate information of what are their natural characteristics, conditions, productions; what they will supply to and require from other countries in large amounts; what influences, natural or artificial, retard or serve to develop them as contributors to the wants or the wealth of nations or as claimants upon foreign products of soil and labor. In this view, Paraguay and the region it represents appear to be one of the most interesting portions of South America to the agriculturists of this country.

PERU.

The Republic of Peru, on the west coast of South America, has an extent along the Pacific, from 3° 21′ S., of 1,240 miles, and its breadth in the northern part is about 800 miles, narrowing southward to less than 200 along the northern line of Chile. It is bounded on the north by Ecuador, on the east by Brazil and Bolivia, on the south by Chile, and on the west by the Pacific Ocean. It was anciently remarkable, in its then greater extent, for the superior civilization of its people, for its peculiar agricultural development west of the Andes, and for its great mineral wealth, which is still far from being exhausted. Its present area is variously estimated at from 463,747 to 480,000 square miles. In this article the first estimate, an aggregate of estimates by departments, is assumed to be nearest the true area. It is, then, a little less in extent than Texas, New Mexico, and the Indian Territory combined.

Peru is divided into nineteen departments, and these into ninety-five provinces. The area and population of the former were reported in the last census, in 1876, to be as shown in the following statement, which presents the departments by geographical divisions according to general character and extending in order from north to south, viz:

Department.	Area.	Population.	Capitals.
Coast region.	*Sq. miles.*		
Piura	13,931	135,502	Piura.
Lambayeque	17,939	85,984	Chiclayo.
Libertad	15,649	147,541	Trujillo.
Ancachs	17,405	284,091	Huaraz.
Lima	14,760	226,922	Lima.
Callaó		34,492	Callaó.
Ica	6,295	60,111	Ica.
Arequipa	27,744	160,282	Arequipa.
Moquegua	22,516	28,786	Tacna.
Mountain region.			
Cajamarca	14,188	213,391	Cajamarca.
Huánuco	33,822	78,856	Huánuco.
Junin		209,871	Cerro de Pasco.
Huancavelca	10,814	104,155	Huancavelca.
Ayacucho	24,213	142,205	Ayacucho.
Apurimac	62,325	119,246	Abancay.
Cuzco	95,547	238,445	Cuzco.
Puno	39,743	256,594	Puno.
Eastern forest region.			
Amazonas	14,129	34,245	Chachapoyas.
Loreto	32,727	61,125	Moyobamba.
Total	463,747	2,621,844	

In 1876, Peru contained territory and population that since the war with Chile pertain to the latter country. The transferred population amounted to over 51,000, the census showing in 1876 a total for the whole area of 2,673,075, of which there was an excess of males of 31,227. Of the whole, 57 per cent were Indians, 23 per cent mestizos (mixed Indian blood), 20 per cent Spanish by descent, negroes, Chinese, and foreigners. The increase of population from 1862, when an official estimate was made, to the census of 1876, was 185,359, or less than 7 per cent in fourteen years, according to deduction from the figures given in the Encyclopædia Britannica.

CONSTITUTION AND GOVERNMENT.

Peru declared its independence of Spain July 28, 1821, and secured it in 1824, after a less protracted struggle than that of many of the Spanish-American dependencies. By its present constitution, adopted in 1856 and revised in 1860, the Government is modeled to a considerable extent on that of the United States, the executive power being vested in a president and exercised through one or more of five cabinet ministers, and the legislative in a senate and house of representatives. There are two vice-presidents, who, like the president, are elected for four years. The senators are elected from the provinces in the proportion of one for each 30,000 inhabitants or fraction of over half that number, and the members of the lower house by the electoral colleges of the provinces of each department, at the rate of two if the department has two provinces and one more for every other two provinces in said department. Parochial electoral colleges send deputies to the provincial colleges which elect the congressional representatives and also elect the municipal councils. The nineteen departments are administered by prefects and the ninety-five provinces by subprefects, the former officials deriving their appointments from the president. The judiciary comprises a supreme court and superior and lower courts, besides the special courts of the various municipalities, unconnected with the general system.

GOVERNMENT FINANCES.

The sources of state income were formerly the guano and saltpeter deposits principally, but guano is fast disappearing and the principal nitrate sources have passed under the control of Chile, although Peru still has a dividend from their income by treaty arrangement. By the law of 1886, providing for revenue, the latter is raised from import and export duties, modifiable on an ad valorem basis by the treasury department from time to time; from 5 per cent real-estate tax upon rental value in town and country; license of 5 per cent upon the value of productions of occupations, and a like tax upon movable capital; stamp taxes; stamped paper for addressing public officers; 30 soles (1 sol silver

=73.5 cents United States) per annum upon each mining claim; proceeds of postal service and telegraphs; duties on wills and inheritancies, excise duties, bridge tolls, etc., and a poll tax upon each male person between the ages of 21 and 60, except ecclesiastics, soldier, and sailors, of 4 soles for the coast provinces and 2 for the interior.* The income from railways, then applicable to administrative uses, has recently been assigned to a special use, as hereinafter set forth.

Estimates of Department expenses are made for biennial periods. The revenues for the year ending May 31, 1890, were in United States value $4,612,270, and the expenditures $4,330,489, the customs yielding $3,672,019.

The foreign debts due to British capitalists and incurred for railroad-building amounted in 1890 to $153,679,593 (£31,579,080), with interest in arrears since 1876. By a contract with the bondholders the railways now existing, and extensions, etc., to be constructed, are given up to their control and for their benefit for sixty-six years from January 1, 1890, in part payment of the debt; and, further, the guano of the country up to 3,000,000 tons is ceded, with a share of the income from the guano sold by Chile under treaty stipulations, and the Government is bound to pay thirty annual money installments of £80,000 ($389,320), which must be reserved in monthly sums from the customs receipts of the port of Callaó; but this last payment has not been kept up.

In connection with this contract for payment of the foreign debt there are other contracts forming parts of the extensive series, by which extensions of the railway system are to be made, immigration promoted, etc., on one hand, and, on the other, concessions of vast tracts (4,942,000 acres) of land are made to the bondholders under the name of the Peruvian Railways and Development Corporation (limited), registered in London, "it being understood that the rights and obligations of this contract," which includes the series, "can only be transferred to English companies organized and established in London."† A consideration of these facts makes it apparent in some degree that no great extension of our commercial intercourse with Peru is likely to take place for the near future or upon a liberal basis.

PHYSICAL DIVISIONS.

As indicated in the division of the departments in the foregoing table of areas and population, Peru has three divisions characterized by differences of soil, climate, water supply, and prominent physical features. Apparently the most prominent of these is the central or Andean division, while the Pacific or coast division and that lying east of the great mountain chains, with the Amazon as its main or only natural outlet to

* See dispatch of United States Minister Buck, containing the law, in No. 90 of Consular Reports.

† Child's Spanish American Republics.

the world, are really as defined in their peculiar and different characters. The mountain or central region is wonderfully rich in minerals, such as gold, silver, platinum, copper, tin, lead, cinnabar, quicksilver, iron, and coal, and petroleum wells are now successfully worked by an American, furnishing cheap fuel to some of the railways. In this region are also fertile valleys and extensive tablelands fit for pasturage, and the valleys at least are well watered, while the eastern slopes are visited by rains. Surplus production is, however, discouraged by the lack of cheap and adequate transportation.

An article in the American Cyclopædia tersely describes the physical features of the country as follows:

The country is traversed by the Andes in two separate ranges, the Cordillera Oriental, or Andes proper, and the Cordillera Occidental, or coast ridge; to which is added a third and still more easterly chain N. of the parallel of Pasco, about 11°. The coast ridge enters the Republic from the south, and running almost parallel to the shore, at a distance of from 45 to 65 miles, unites with the Cordillera Oriental in the *nudo*, or mountain knot of Yilcanota, between latitude 14° and 15°, the northern limit of the great interalpine plain containing Lake Titicaca, a comparatively small portion of which belongs to Peru. * * * The table-land of Cuzco, comprising an area of about 15,000 square miles, on the flattened crest of the Andes, has a mean elevation in the south of 11,500 feet above the sea, or about 1,000 feet more than in the north, and is divided by low transverse ridges into numerous valleys. * * * A little north of the parallel of Pasco the Andes separate into three chains. The most easterly, a small lateral branch, trending first northeast for two degrees and then curving abruptly northwest, divides the valleys of the Ucayali on the east and the Huallaga on the west, but gradually lowers until in latitude 6° 40′ it is crossed by the latter stream and finally disappears before reaching the southern bank of the Amazon. The second, or Andes proper, is the dividing line between the basins of the Huallaga and the Marañon; and the third, or Cordillera Occidental, runs between the Marañon and the coast. * * * The coast chain and Cordillera Oriental do not again unite before the Nudo de Loja beyond the Ecuadorian frontier, the mean height of which does not exceed 6,500 feet. * * * The valley here inclosed by them embraces some of the hottest portions of the Andine region. * * *

The tract called *la costa*, or the coast, between the steep ascent of the Cordillera Occidental and the Pacific, varies in width from 20 to 50 miles, and slopes towards the ocean with a very irregular surface and rapid descent, furrowed by deep depressions or gullies, which run from the mountains to the sea. These gullies are generally traversed by rivers, many of which are dry during a great part of the year. The ridges between the rivers are complete deserts, varying in breadth from 10 to 90 miles. The surface is very uneven, and is covered with hillocks of considerable size, composed of fine, light-yellow drift sand, which is often driven about with great velocity by the wind, and ascends in columns to a considerable height. All traces of a path between the river valleys are thus obliterated, and no stranger can travel from one to another without a guide, who generally directs his course by the stars at night, and by the wind during the day, which almost always blows from the south.

Relative to the region east of the mountains, which comprises about a third of Peru, Mr. Child states as follows, in the article heretofore noted:

At present this vast territory, watered by the great tributaries of the Amazon, the Marañon, Huallaga, Ucayali, Urubamba, Inambara, etc., is most inaccessible. The Peruvian officials sent there to exercise nominal rule, and often to find Brazilian officials in practical command, reach their seat of government most easily by steamer to

Panama, across the isthmus, round by Pará, then up the Amazon by steamer, and the rest of the journey as best they can. The cocoa, caoutchouc, cinchona, and other products of these rich tropical regions, inhabited by Indians, are carried on rafts down the tributary streams until an Amazonian factory and steamer are reached. It is simply a wild country, where the vegetation is so luxuriant that if you can cut a path through the virgin forests that cover the ground it will be grown over and disappear entirely in a fortnight. Nature is here so full of exuberant strength that she becomes the enemy instead of the friend of man, and the only hope of clearing the land for agriculture would be by organized armies of thousands of colonists working simultaneously and collectively. According to the most impartial and practical witnesses, the task of reducing this tropical nature to subjection would invariably fail unless organized on a vast scale, and by powerful companies having thousands of hands at their command. In any case, the first thing to do is to render these provinces accessible, so that colonists may reach them, and so that their products may be brought to a seaport.

And, in passing, as to the near possibility of this rich region being agriculturally developed, the author further states:

As the 2,000,000 hectares of land granted to the Peruvian Railways and Development Corporation must necessarily be selected mainly on the eastern slopes of the Andes, and as the contract requires the colonization to be commenced within three years (from January 1, 1890), and the lands settled within the maximum period of nine years, whereas limits of time ten times as long would scarcely be sufficient, we may justly regard this clause of the contract as of no practical importance.

This general characterization of the three distinct natural divisions of Peru may be particularized in relation to the coast and eastern divisions, so far as to afford a better view of the agricultural possibilities and natural productions of the country. As to the coast region an excellent and careful article in the Encyclopædia Britannica states in substance that of the fifty streams which cross this apparently, and to the greatest extent actually, desert region half are derived from the main Andean chain and afford constant water, while the other half rise in the coast range, which never reaches the snow line, and they therefore furnish water only during the rainy season in the mountains. The bearing of these facts is apparent when we consider, in the words of the article just mentioned, that "The constantly prevailing wind on the Peruvian coast is from the south. From November to April there are usually constant dryness, a clear sky, and considerable though by no means oppressive heat. From June to September the sky is obscured for weeks together by fog, which is often accompanied by drizzling rain;" yet this drizzle is altogether insufficient for agricultural purposes, so that the only dependence is upon irrigation, and irrigation is only practicable in the valleys, which are short and narrow, and is sufficient only in those where the rivers rise in the main Andean chain, and give a constant supply of water.

As to the coast lands which can be utilized by irrigation, Mr. Child states, with the emphasis of italics: "All the land in the coast valley is occupied to the full extent of the water supply." He adds:

Higher up in the mountains there is a certain amount of available land, not, however, of a nature adapted to modern agricultural methods, and much of it requiring

the terrace and irrigation system which were employed by the Incas. This land, too, in spite of expensive mountain railways, would always remain at a disadvantage for want of easy communications with a market.

The northern desert region of the coast, according to the Encyclopædia Britannica, extends from the northern limit of Peru to the Morrope Valley, 200 miles, and is crossed by three rivers, two of which rise in the main range of the Andes. Here rain sometimes falls and "at intervals of ten years there are occasional heavy showers from February to April." The second region southward extends 200 miles and contains nine valleys, all but two of which are well watered. The third region is also 200 miles long and contains eight valleys, five of which have dry river beds during the most of the year; but in these fertility is maintained to a considerable extent by means of wells. There are over 45 leagues of desert, or 67½ per cent, in this region. The next extends over 300 miles, from Chancay to Nasca, and is watered by twelve rivers. Says the authority above referred to:

> Here the maritime range approaches the ocean, leaving a narrow strip of coast, but the fertile valleys are closer and more numerous. Those of Carabayllo and Rimac are connected, and the view from the bay of Callaó extends over a vast expanse of fertile plain bounded by the Andes, with the white towers of Lima in a setting of verdure. Lurin and Mala are smaller valleys, but the great vale of Cañete is one green sheet of sugar cane, and narrow strips of desert separate it from the fertile plain of Chincha, and Chincha from the famous vineyards of Pisco. The valleys of Ica, Palpa, San Xavier, and Nasca are rich and fertile, though they do not extend to the sea; but between Nasca and Acari there is a desert 60 miles in width.

The Arequipa and Tacna region comes next south, extending over 350 miles, and including thirteen valleys, watered mostly by streams from the main range, well supplied with water. The coast valleys through which the Majes and Locumba flow are famous for their vineyards, and in the valley of the Tambo there are extensive olive plantations. Arequipa is scarcely a coast valley in fact, as it lies on the northeastern slope of the coast range of mountains and is 90 miles back, but agriculturally it may be included in the group of adjacent valleys. The most southern desert region extends through the department of Moquegua to the Chilean limit in a narrow strip, through which but two rivers reach the sea, and is without agricultural significance.

Relative to the eastern division of Peru, the products of which, both spontaneous and cultivated, are of much interest and are likely to become of greater importance to international commerce than the productions, except mineral, of the western division, the information to be had is not always so precise and full as could be desired, as the country is less accessible and less developed than the well-known coast region, from which, for nearly four hundred years, Peru has been judged. It embraces considerably more than one-third of the whole area of the Republic, is tropical in most parts, with modifications of its climate upon the mountain slopes and sometimes extensive table-lands; is abundantly watered by rains and rivers, and their innumerable tributaries;

has great resources of river transportation, which could be still farther extended by improvements which would suggest little difficulty to a progressive people; and all that can be said of the Amazonian region generally as to natural-growth productions can be as truly said of this partly Amazonian one, with the addition that portions of it are as well suited to cereal culture as is the coast region, and that its valuable mineral resources are perhaps quite as rich, and easier of development with labor at hand, as are those of the western side. All the area is not covered by tropical forests, and not all such forests are supremely difficult of subjugation.

Of the country about Huánuco, in an elevated portion of this region, Robert Proctor said in 1825, in "Narrative of a Journey across the cordillera of the Andes," etc.:

It is a hot, but nevertheless fertile valley, which produces the best sugar, coffee, cotton, cocoa, and tobacco grown in Peru; besides which it is famous for its fruits. * * * I have already described the country on the western or Pacific side of the Andes as a succession of sandy plains and hills now and then refreshed and fertilized by a torrent from the mountains, which produces a small green valley in the midst of desolation.

Then he continues:

The eastern side of the Cordillera presents a very different aspect, and the country, as soon as you are clear of the mountains, stretches out into fine plains intersected by navigable rivers and covered with woods, where the soil, which is also blessed with rain, yields spontaneously all the fruits and other productions of tropical climates. Here, however, ends civilized population; the Spanish adventurers penetrated very little farther than the mountains, which contained their darling ore.

The northern part of eastern Peru is included in the department of Loreto. M. Olivier Ordinaire, formerly consul of France at Callaó, in a report published by the Geographical and Commercial Society of Paris, and sent in translation to our Department of State by Minister Buck from Peru,* says of this region as follows, after personal investigations:

Although the soil is fertile even to excess, agriculture hardly exists in the department of Loreto. All activity of colonists is absorbed by the working and commerce of gutta-percha. Perhaps there is no more favorable region existing for the cultivation of rice. * * * The same with potatoes, that are imported to Iquitos from Havre and Lisbon, [although] the neighboring mountain valleys would produce them in abundance, and of the best possible quality. * * * The Peruvian Amazon in reality does not export other agricultural products than the Tarapoto tobacco. The sugar cane cultivated on some haciendas on the Marañon is converted into rum, which is consumed in the department itself. The plow is not known there. After having burned the forest, the ground is planted or sown without breaking the soil. In the valley of the Ucayali the mud of the river is taken advantage of. When the waters decrease on the river borders, corn, onions, and beans are sown, and the crop is harvested long before the rise of the river. Corn ripens at four months; onions, beans, and turnips at three. In the Marañon farms the sugar cane of from 3 to 4 meters high† is cut at eight or nine months of age, and the plant endures twelve years. * * *

* Consular Reports, No. 81, 1887.

† 39.37 inches to the meter.

But what most attracted my attention in Peru and in the powerful soil of the Amazones was the vigor it gives to the vine. * * * The first stock I saw was at Yurimaguas. It formed an immense vine containing more than three hundred bunches of grapes, of medium size, good grain, black, and slightly acid. I found many like it on different farms, especially in Caballa Cocha on the shores of a small affluent of the Marañon, it being assured to me everywhere that ordinarily they gave three crops a year. * * * Nevertheless, no one has yet cultivated the grape in the department for making wine. All the wine drunk at Iquitos is imported from Europe, and is expensive. The same is true of some vegetables, which are brought from the Ucayali, which bring very high prices. Therefore horticulture and vine culture would give larger returns in the neighborhood of that city, and more sure, perhaps, than even gutta-percha.

As to the industries of the eastern part of Peru, the writer says:

The population of Moyobamba, Sarapoto, and Somas, that lived on the [so-called Panama] hat industry, has considerably diminished, and in my trip on the borders of the Ucayali and Pachiten I found quite a number of its ancient inhabitants actually employed in the more lucrative gutta-percha industry.

The plantation situated in the neighborhood of the small town of Sarapoto, and on the left bank of the Huallaga at 3 leagues distance from the river, produces nearly 5,000 arrobas (125,000 pounds) of tobacco annually. The current price at Tarapoto is 6.40 soles ($4.70) per 25 pounds, and the expenses from Tarapoto to Pará are $1.36.

Says the writer of this interesting report, which, however, is so written as to be little suited to direct quotation for present purposes:

In conclusion, excellent for improvement, the basin of the Amazones is likewise one of the places of the torrid zones most favorable for colonization.

This opinion is opposed to that of Mr. Child, before quoted, in so far as it may apply to identical areas; but it has the support of such knowledge as we possess of similar Brazilian and Bolivian and Venezuelan regions, and that of the upper Paraná, in the Argentine Republic, and is without doubt in the main correct. It has the decided advantage also of being the opinion of an actual investigator of the country here considered.

CLIMATE AND SOIL.

In the citations already made as to the agricultural character of the three natural divisions of Peru, there has been almost necessarily included such information as generally and often specially indicates with much certainty the character of the climate and sometimes that of the soil. As the maritime range is of volcanic nature, the coast-belt surface, either expelled directly or washed down from it, is principally, as in Chile, of volcanic origin and rich in character. Wherever water can be applied, excellent returns in production are certain, varied by the skillful or careless manipulation of material entering into such production. That there are practically no rains west of the coast range is due to the interposition of the Andean chain, which exhausts the clouds of moisture, as has been shown more fully in the consideration of the climate of Brazil, in another article.

In the absence of any climatological tables for any part of this interesting country, it is, perhaps, apparent enough, from what has been

incidentally adduced, that the climate is greatly varied, ranging from tropical to nearly temperate in the agricultural regions, and from temperate to arctic, according to elevation, in the central mountains. As to the soil of the eastern side, lying nearer the mountains than does the Brazilian-Amazonian region and partaking more of their less exhausted disintegrations, the statement of Consul Ordinaire that the former is the richest and best for agriculture may be credited, as might be a similar statement relative to the valleys and tablelands of the Andean region.

AGRICULTURAL AREA.

If the census of Peru, like that of Chile, gave the amount of lands actually under cultivation, or if the Government published any statistics of production, the amount of agricultural lands in the most settled regions might be stated with a degree of gratifying precision. But official industrial and commercial statistics of the country for many years have not been published, and there is no basis for specific statements of the agricultural value of any department or of the whole.

The west part, between the coast mountains and the Pacific, is what is longest and best known as the area of agricultural production. This, as we have seen, consists of a belt of rich land over 1,200 miles long, and from 20 to 90 miles wide from the sea to the foothills, which averages probably not to exceed 40 miles in width, and which gives a total coast area of 48,000 square miles, or less than the area of North Carolina. Of this only that is available for agriculture which can be irrigated (and is now to the extent of the natural water supply, as Mr. Child states from observation), and this at a liberal estimate can not exceed one-third, as some of the deserts intervening between the valleys are 90 miles wide. There is, then, in this best known and long cultivated region an agricultural area of excellent character of about 16,000 square miles, 1,000 less than the size of the States of Massachusetts and New Hampshire, and comprising less than 3½ per cent of the whole area of the country.

With the great intramontane valleys and tablelands unreckoned, which are already to some extent utilized, and the whole eastern region practically undeveloped, though now coming to the world's attention for its natural and agricultural productive qualities and for its splendid advantages of transportation through the Amazon and some of its large affluents, it may be properly supposed that the real agricultural Peru is generally unknown, and that it never will be adequately understood until such enterprise as is foreign to native modes and habits develops to a much greater extent that upper Amazonian region which lies along the eastern foot of the Andes and which possesses the natural advantages of every productive clime. In fact the greatest calls of the world upon the agricultural and kindred productions of South America are inevitably to be met, in increasing and sufficient amount, from the

far interior of that country, from Colombia, Venezuela, Ecuador, Peru, Bolivia, western Brazil, Paraguay, northern Argentina, and Uruguay, through the Orinoco, the Amazon, the La Plata, and their tributaries.

AGRICULTURAL PRODUCTIONS.

The principal agricultural productions are sugar, cotton, tobacco, rice, cacao, maize, coffee, grapes, and all the vegetables and fruits suited to the climate and required for home consumption. Considerable wool is also produced, from sheep, the alpaca, llama, and the vicuña, the three latter being native animals. The forests furnish india-rubber gum, cinchona, medicinal plants, dyewoods, etc. The principal productions for export, however, are products of the mines, silver and copper, niter, and guano, both of which latter, however, are nearly exhausted. What the value of any of these productions is for any one year can not be stated, as it is unascertained or unpublished. The value of the shipments of much the larger part of the surplus is shown under the next following head, particularly in the table of commerce with Great Britain.

The production of sugar in the region about Lambayeque in 1887 was reported by the American consul to be over 176,000,000 pounds, which was about the usual production. There was exported from the port of that locality as follows, the shipments to Chile being principally for transshipment by steamer to England: To England direct, 26,345,622 pounds; to Chile, 29,827,928 pounds; or, in all, to England about 56,173,550 pounds; to the United States of Colombia, France, Germany, and Ecuador, 777,095 pounds; total, 56,950,645 pounds.

The total production of rice is estimated by the minister of agriculture at about 22,000,000 pounds, principally of the department of Lambayeque. Cotton is mostly the product of the department of Piura, and is wholly of long fiber. There is excellent cacao raised in the department of Cuzco, in the province of Convencion, but little is exported. Cultivation and production can be indefinitely extended east of the Andes, and among the mountains also, as can that of coffee, and eastern Peru is yet to be widely known in this respect. The value of the coffee exported, mostly to Chile, in 1876 was only $4,360. Maize is raised in sufficient quantity generally for home use. It is said to be superior to that of Chile, and includes several varieties. The department of Cuzco is the greatest producing region. Potatoes, though a native plant, are not extensively cultivated, yet thrive finely in many parts. A yellow variety has the preference for cultivation. Grape culture is less extensive than in Chile, but the products are of excellent quality. The annual yield of wine is about 2,640,000 gallons, and of brandy 793,000 gallons.

FOREIGN COMMERCE.

It is only by resort to the statistics of other countries that the character and amount of the foreign trade of Peru can be approximately shown. It can not be shown in all cases, as some countries, Germany,

for instance, do not give the value, but the weight, of articles of foreign trade. The most of the trade of Peru is with Great Britain, France, and the United States, which give values; with Germany, which gives weight only, and with Chile, which publishes no detailed statement. The following tables show, from annual statements, the character and value of the trade between Great Britain and Peru for certain recent years, and help to an idea of the value of Peru's surplus production in the showing of exports:

Articles and values of imports of Peru from Great Britain for the calendar years named.

[Values in United States money.]

Articles.	1886.	1888.	1890.
Apparel	$44,402	$37,496	$46,368
Arms and ammunition	35,341	38,791	16,493
Bags and sacks	75,440	181,632	30,270
Caoutchouc	20,795	21,393	19,709
Carriages, railway	3,737	90,220	12,765
Coal and fuel	119,117	379,937	224,827
Cordage and twine	24,707	29,296	28,518
Cotton yarn	7,699	10,638	3,932
Cotton goods	1,917,231	2,383,077	2,085,164
Earthen and china ware	40,674	45,716	70,097
Hardware and cutlery	89,573	70,749	66,812
Implements and tools	43,146	60,184	60,130
Jute manufactures	30,795	40,509	47,750
Linens	29,661	32,148	29,554
Machinery	156,696	214,107	254,693
Medicines and drugs	52,724	44,528	33,350
Metals, iron and copper	302,278	585,990	501,449
Painters' materials	33,803	41,073	32,941
Provisions and pickles	46,076	62,437	37,097
Stationery	20,751	23,549	20,133
Telegraphic materials	34,455	33,988	839,131
Woolens and worsteds	765,296	743,660	629,594
All other articles	317,422	408,786	342,032
Total imports	4,211,819	5,579,904	5,442,809

Articles and values of exports from Peru to Great Britain for the calendar years named.

[Values in United States money.]

Articles.	1886.	1888.	1890.
Chemicals	$131,824	$30,250	$95,957
Copper ore	2,083	68,180	103,223
Copper regulus	.....	17,325	16,546
Copper, unwrought	81,285	58,836	38,888
Cotton	930,690	996,085	1,138,265
Drugs, etc	62,525	12,989	5,436
Guano	1,007,239	595,290	.....
Hides	24,337	14,045	2,039
Nitrate of soda	2,690,931	4,127,668	.....
Silver ore	148,696	220,107	139,561
Skins and furs	5,884	1,017	39
Sugar, unrefined	1,646,731	1,797,534	2,006,195
Tin ore	45,137	175,759	31,004
Tin in blocks, etc	40,694	41,151	7,976
Wool, alpaca, vicuña, and llama	846,192	811,771	928,056
Wool, sheep and lambs'	304,044	269,478	396,766
All other articles	162,590	347,396	251,603
Total exports	8,130,882	9,584,881	5,151,554

While the foregoing tables show the character of Peruvian international commerce, they also show that Peru only derived, in 1890, $37,097 worth of goods in the nature of agricultural products from the country

with which its largest trade is; while the exports to that country, of a kind related to agriculture, aggregated $3,333,095, of which $2,006,195 was in raw sugar and the balance in animal products, as hides, furs, and wool. The table of imports shows a falling off from 1888, and that of exports a continual decrease for the two preceding annual periods. It is probable, however, that the exports of guano and nitrate of soda should be credited to Chilean trade account, at least in part, for 1886 and 1888, in which case the value of exports to Great Britain for the several years would appear to have been pretty constant.

The small amount which Peru spends annually upon foreign articles of agricultural derivation is better shown, as to variety and character, by its imports from the United States, as set forth in the following statement of trade for 1890. The agricultural products imported into Peru from this country in 1886 amounted to only $181,387 and in 1888 to $183,954, while in 1890 they rose to $400,393, as is shown in our Treasury reports. So far as can be ascertained there are practically no such imports into Peru from other countries than this and Great Britain, the small sum of their value being included, in other cases, under the designation of "all other countries." France imports only guano and nitrate of soda from Peru, and does not classify her exports to that country; and Germany gives, as in other cases, the weight of articles only.

Value of field products and other articles imported into the United States from Peru during the fiscal year ending June 30, 1890.

Articles.	Value.
Cacao	$13,026
Cotton	50,390
Skins:	
Goat	216,397
Other	20,122
Rubber gum	3,734
Total field products	305,669
Other articles	46,026
Total imports	351,695

Value of farm and field products and other articles exported from the United States to Peru during the fiscal year ending June 30, 1890.

Articles.	Value.	Articles.	Value.
Lard	$285,190	Milk	$222
Wheat	77,225	Linseed oil	187
Timber	14,265	Bacon	180
Lard oil	4,138	Vegetables	142
Rosin	3,695	Cheese	130
Grease	2,819	Butter	99
Hams	2,514	Rice	63
Tallow	2,492	Cotton seed	50
Fruit	2,027	Canned beef	30
Pork, pickled	1,447	Seeds	3
Flour	658		
Sundry meat products	638	Total, farm and field	400,393
Candles	608	All other exports	1,018,168
Bread and biscuits	593		
Pickled beef	718	Total exports	1,418,561
Sundry food articles	245		

Relative to the amount of exportation of principal articles of agricultural production of 1889, the Peruvian minister of agriculture made a report to Congress in 1890, which, tabulated, gives the following:

Articles.	Pounds.	Articles.	Pounds.
Sugar	99,207,000	Rice	963,600
Cotton	2,939,979	Coffee	59,774
Forage	143,000	Cacao	2,581

But in the same year there were imported similar productions as follows: Rice, 10,176,320 pounds; coffee, 56,430 pounds; potatoes, 440,000 pounds; forage, 114,400 pounds; and tobacco, 107,712 pounds; while the importation of wheat was 687,745 bushels of 60 pounds, and in 1888 it was in amounts and distribution as follows: From Chile, 526,950; United States, 307,243; Australia, 7,446; and Spain, 3,666; in all 845,305 bushels.

The following-named agricultural and related articles were made free of customs charges in March, 1889: Animals for breeding, tan bark, hops, lumber, pitch and tar, and seeds of all kinds. Flour pays a duty or 3½ cents and wheat 1 cent per kilogram (about 2.2 pounds), lard 25 per cent ad valorem, canned meat 40 per cent, rice 25 per cent, wines 65 per cent, and animals not for breeding 10 per cent. Goods by way of the Amazon pay a uniform duty of only 7½ per cent ad valorem.

The exports from the eastern part of Peru are all forest products, chiefly cinchona, rubber gum, and sarsaparilla. Rubber gum pays an export duty of 4 per cent ad valorem, while the Brazilian product pays 23 per cent.

MEANS OF COMMUNICATION.

Like the most of South America, Peru has few and poor roads, and transportation is mostly upon the backs of animals, except where railroads can be made available. The railway system has been more costly in Peru than elsewhere, because of the difficulties presented by the mountains, and as the system is fragmentary the cost of operation is also enhanced. But railway extension presents the only means of further developing the country from the western side and opening up the vast mineral riches of the mountain region, as well as stimulating agricultural production in the interior valleys.

The report of the Hon. F. C. C. Zegarra, delegate from Peru to the Pan-American Congress, shows that the country had in 1890 thirteen railroads in operation, the length of eleven of which is reported as aggregating 759.93 miles, the shortest of which has an extent of but 3.72 miles and the longest 229.92. There are numerous projected lines, principally for prolongation of those now in use into the interior. None of the roads connect with those of other countries, but it is intended that the one from Arequipa to Puno, the longest, shall be prolonged to

Desaguadero, and connect with the system of Bolivia when that is completed. Telegraphic lines connect the principal cities of the Republic and with other countries.

PUBLIC SCHOOLS.

The statement should not be omitted that Peru has a good school system, including the oldest college in the Americas,* the University of San Marcos, at Lima. Tuition in the common schools is free, and attendance compulsory. Official recommendations have been made that one or more schools of agriculture should be established, but the movement does not appear to gather impetus. In fact, with the railways and commercial revenues given over almost wholly to the bondholder, and the nitrate deposits absorbed by Chile, progress of any kind has little chance of being promoted with government aid.

CONCLUSION.

Such, in brief, is the aspect presented to the world, differing little for several generations, by one of the richest and in many ways most attractive countries of the American group. The natural resources of the Republic are not surpassed by any Spanish American state, and probably not equaled; and yet progress seems to be an exotic there, of uncertain endurance, and for the benefit of aliens. At present, agriculturally, Peru is only self-supporting, and for surplus gain it has much too long depended upon its mineral resources. Were these obliterated, leaving other natural conditions as they are, it is not too much to suppose that the nation would become rejuvenated. The statement of Mr. Theodore Child may be quoted, without full indorsement, as giving at least an honest opinion of a friendly critic:

> Peru is not a new country, but an old and decrepit one, presenting many points of resemblance to modern Spain. Its history is more or less a repetition of that of Spain, and its regeneration presents similar difficulties. In Peru we find remnants of the past civilization of the Incas, whose irrigation works, now fallen to ruins, suggest comparison with the works of the Moors, which made fertile vast territories in Spain that are now as barren as the brown quebradas of the valley of the Rimac. * * * The Peruvian nation * * * is sluggish and inclined to linger in the old ruts, looking only to present and personal interests and not to the future collective welfare of the nation.

It should be remembered, however, that Peru has only lately come out of a war which proved unusually disastrous to her in the destruction of railways, plantations, buildings, both public and private, farm implements, machinery, stock, and personal property of all kinds, and which deprived the country of a part of its territory, and with that an inexhaustible source of ready revenue. Still, all that which can make Peru prosperous in civilization, and truly great, remains.

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* Encyclopædia Britannica. This claim is disputed in favor of the college of Córdoba, in the Argentine Republic, said to have been founded in 1610. San Marcos claims from Charles V in 1551.

URUGUAY.

The Oriental Republic of the Uruguay, as the smallest of the South American republics officially designates itself, instead of being also the least interesting, is in many respects one of the most progressive. Bounded on the north and partly on the east by Brazil, farther on the east and on the south by the Atlantic, and on the west by the estuary of La Plata and the Uruguay River, which divide it from the Argentine Republic, it is nearly inclosed on three sides by navigable waters as well as intersected by numerous navigable streams. Of its total frontier of 1,074 miles 200 is upon the Atlantic, 155 upon the La Plata, and in a direct line 270 upon the Uruguay, making 625 in all.

Uruguay was upon its first settlement a part of the viceroyalty of which Buenos Ayres was the capital, but subsequently became a province of Brazil, and so remained until on the 25th of August, 1825, it adopted a declaration of independence, which was given full effect by a treaty of August 27, 1828. A republican constitution was sworn July 18, 1830, by the provisions of which the Government is divided into the three usual branches. The President is elected for a term of four years, and is ineligible for the succeeding four years. The national legislature consists of a senate and chamber of deputies, which meet in annual session extending from February 15 to July 15; but in the interval two senators and five deputies are instrusted with legislative powers. Senators, one for each of the nineteen departments, are chosen by an electoral college for terms of six years, the colleges being elected by the people. One-third of the senators retire every two years. Deputies are elected for a term of three years, one to every 3,000 adult male inhabitants who can read and write, there being a total of 53 such representatives. The vice-president, elected for four years, presides in the senate. The judiciary system is similar to that of other South American countries, based upon that of the United States.

AREA AND POPULATION.

Uruguay extends from a little above 30° south latitude to about 35° south, or 346 miles north and south; and from longitude 53° to 58° 30′ west, or about 290 miles from east to west, corresponding in position, relative to the equator and to a warm ocean current, to the State of Georgia, and having a similar climate as to temperature. Its area as given in the Statistical Annual of Uruguay is 186,920 square kilometers, or 72,170 square miles (English), about 2,000 square miles less than

that of the State of Washington. The estimated area of each department, with its estimated population, in the above-named government publication for 1889, with the names of the several departmental capitals, are given in the following table, viz:

Department.	Area.	Population.	Capital.
	Sq. miles.		
Artigas	4,394	12,000	San Eugenio.
Canelones	1,835	68,359	Guadalupe.
Cerro Largo	5,755	19,697	Melo.
Durazno	5,527	22,403	Durazno.
Flores	1,745	15,295	Trinidad.
Florida	4,675	27,173	Florida.
La Colonia	2,193	35,405	Colonia.
Maldonado	1,585	16,564	Maldonado.
Minas	4,826	22,535	Minas.
Montevideo	256	185,211	Montevideo.*
Paysandú	5,117	28,417	Paysandú.
Rio Negro	3,271	14,265	Independencia.
Rivera	3,792	18,966	Rivera.
Rocha	4,281	17,549	Rocha.
Salto	4,865	25,027	Salto.
San José	2,688	21,147	San José.
Soriano	3,561	26,133	Mercedes.
Tacuarembo	8,117	22,363	San Fructuoso.
Trienta y Tres	3,687	15,748	Trienta y Tres.
Total	72,170	614,257	

* Also the capital of the Republic.

The latest census of the province of Montevideo, November 18, 1889, showed a population of 214,682, of which 100,104 were foreigners, the balance mostly of mixed Spanish and Indian blood, and four-fifths lived in the city of Montevideo. The province of Artigas has less than 3 inhabitants to the square mile, while that of Montevideo has, taking the last census number for a guide, 838.6; and nearly or quite half of the population is contained in three of the nineteen provinces. Increase by immigration, for which effort is made, has been considerable during the last few years, both Uruguay and Paraguay profiting in this respect from the Argentine reverses.

PUBLIC FINANCES AND NATIONAL WEALTH.

Uruguay publishes annually what appear to be very complete statistics of the national funds and of the productive capital in the hands of private parties throughout the country. Relative to the former, the principal revenue accrues from customs duties, about one-third being derived from direct taxes, licenses, stamped paper, and stamps. For 1889 the revenue is stated in the Hand Book of the American Republics to have been $15,690,294, the expenditures $15,811,308, and the public debt on January 1, 1890, $81,279,752. Although import duties are high, they are so far below those of Brazil that large quantities of goods are said to enter that country through Uruguay, paying duties only to the latter.

By the customs law of 1888, in force in 1890, "all foreign merchandise imported for consumption" paid a duty of 31 per cent ad valorem,

except arms, powder, hams, meat, butter, cheese, etc., which paid 51 per cent; hats, clothes, shoes, furniture, carriages, etc., which paid 48, and various food preparations 44 per cent.

From statements relative to the payment of direct taxes in 1887, in the Statistical Annual and as given by Child in his work herein referred to, 54,761 proprietors represented $272,529,674 of property, gold value, 51.34 per cent of these capitalists being foreigners and the balance natives. Of the former class Italians lead in number, followed in order by Spaniards, Brazilians, French, Argentines, English, Germans, Swiss, Portuguese, etc. Brazilians have the largest capital, $50,823,238, while the French represent $16,000,000, the English $8,000,000, and the Germans $3,000,000.

MENTAL AND RELIGIOUS INSTRUCTION.

Primary school instruction is obligatory in Uruguay upon children from 6 to 14 years old, and provision is made for this in about 400 public and the same number of private schools, with over 1,400 teachers. There are, for higher education, numerous academical institutions, religious seminaries, a few colleges, and a university at Montevideo having 60 professors and nearly 700 students, besides a normal school for girls, and a technical school upon a military plan for orphan boys over 14 years old. There are also a national library and national museum, and about a hundred newspapers and periodicals. The state religion is Roman Catholic, but there are several Protestant churches tolerated.

MEANS OF COMMUNICATION.

Little can be said in favor of the common highways of Uruguay, upon which "the jolting diligence maintains an undisputed reign over a greater part of the territory; roads are wanting." "As in the Argentine, the railways already made, in making, or to be made, are practically the monopoly of English capital."* The most of the lines are owned by the Central Uruguay Company, and are in regular operation, or, in the case of the three last named below, to be completed in 1892. The length of the lines and their terminal cities are as follow:

	Miles.
From Montevideo to Paso de los Toros	231.78
From Paso de los Toros to Salto	197.60
From Cuareim to Salto	111.23
From Veinte Cinco de Agosto to San José	20.50
From Montevideo to Minas	76.19
From Toledo to Nico Perez	186.42
From Paso de los Toros to Rivera	186.42
Total length	1,010.14

The main lines of these roads connect the western parts of the country with Montevideo, Brazil, and important points on the Uruguay and

* Child's Spanish American Republics.

La Plata rivers. Another line about 45 miles long, likely to be built, would place the Brazilian province of Rio Grande do Sul in direct communication with Montevideo, toward which its business sympathies at least extend.

Through the improved port of Montevideo, and some others, Uruguay has connection with many lines of foreign steamers, and there is all necessary steam service upon the La Plata and far up the Uruguay, as there is to some extent upon tributary streams.

The telegraph lines in operation in 1889 had a length of 2,422 miles, besides a submarine cable of 173 miles. The mails carried nearly six million letters and packets, over fifty-six thousand postal cards, and over fourteen million pieces of printed matter and samples during 1888.

PHYSICAL CHARACTERISTICS.

Relative to the general appearance of the country, away from the principal river, Mr. Child states as follows, after personal inspection in 1890:

> The physical aspect presents a strong contrast with the flat, treeless, and often arid pampas of the Argentine; the Banda Oriental abounds in wood, water, and hills; from end to end the undulation is continuous, and in some departments, for instance Minas, one might almost imagine one's self in Switzerland, so fine does the hill and mountain scenery become. * * * The hill chains are numerous, and spread ove the whole country, forming countless streams, rivers, and lakes. There are also many isolated hills, like the Cerro of Montevideo. The greatest height of the mountains, if they may be so called, is 500 meters (1,640 feet), attained by the Cuchilla Grande, and a little less for other chains of mountains.

As to the appearance of the country along the principal rivers, the same observer states:

> The important rivers number seventeen, of which the chief are the Plata, the Uruguay, and the Rio Negro, the last of which runs through the center of the territory. The Uruguay River is navigable as far as Paysandú for ocean-going ships, and as far as Salto for coasters and for the passenger steamers of light draft of the Platense Company. * * * The scenery of the Uruguay resembles that of the Paraná, being in some places perhaps a little bolder and more picturesque, but in general the aspect of the banks, of the bluffs, and of the towns offers nothing strikingly different from what may be seen on the Paraná between Martin Garcia and Corrientes. * * * The watershed of the Rio Negro covers nearly three-fourths of the Republic, and the soft scenery of its banks is characteristic of large sections of the country.

Situated in the temperate and close to the tropical region, with its eastern and southern parts exposed to the continual influence of a portion of the great equatorial current, Uruguay, with its fertile soils similar to those of Paraguay and its equable temperature, has the possibilities of producing in much perfection most of the crops and fruits of both a temperate and subtropical climate. Agriculture has been developed, however, only in the provinces of Montevideo, Canelones, and Colonia, its progress in the interior not being notable. The three provinces named are the most populous in the country, but their united area is considerable less in extent than that of the State of Connecticut.

The remaining seventeen-eighteenths, larger in extent than the State of Missouri, is mostly in a primitive condition, except as modified by the prevalent industry of cattle-raising.

CLIMATIC CONDITIONS.

Having usually neither extreme heat nor cold, nor an excessive annual rainfall, Uruguay has a climate favorable to health and to outdoor industry, superior to that of any other country of South America, as a whole. The following table, compiled from the Statistical Annual of Uruguay for 1887, exhibits the climatic conditions at Montevideo for several years:

Season temperatures and rainfall at Montevideo for six years ending with the year 1886.

Years.	Seasons.	Temperature, F.			Rainy days.	Rainfall in inches and hundredths.
		Maximum.	Minimum.	Average.		
		°	°	°		
1881	Summer	85.75—	50.47—	68 11—	19	10.82
	Autumn	82.89—	19.40	56.48	13	12.79
	Winter	72.05	5.67—	52.07	34	15.39
	Spring	78.90	14.45	64.04	16	5.78
1882	Summer	90.79—	20.59—	70.28+	16	12.57
	Autumn	78.19—	16.39+	59.32+	14	3.47
	Winter	77.22—	10.85	52.51+	35	3.29
	Spring	86.00	50.00	64.81+	12	5.12
1883	Summer*					
	Autumn	92.75	10.40	62.53—	27	15.84
	Winter	77.00	7.70	53.69+	37	16.61
	Spring	87.80	6.80	60.89	24	13.60
1884	Summer	100.94	20.30	72.39+	18	6.01
	Autumn	92 30	8.60	62.80—	26	14.04
	Winter	80 96	5.36	51.15+	18	5.44
	Spring	87.80	15.44	62.29+	18	12.02
1885	Summer	96 80	51.80	72 57+	14	8 61
	Autumn	86.00	14.00	61.61	23	11.51
	Winter	80.24	5.00	19.81+	16	5.27
	Spring	91.40	8 60	62.22+	21	11.27
1886	Summer	100.04	51.08	73.29+	17	13.85
	Autumn	87 44	13.10	61.80+	19	8.00
	Winter	71.60	5.36	50.52+	16	6.88
	Spring	86.00	14.00	59 36	24	6.61

* Not stated. These observations were taken by the Society of Sciences and Arts.

Dr. Martin de Moussy observed the temperature, rainfall, and winds at Montevideo from 1843 to 1852, and states that only once in that time the themometer showed 41° C. (105.8° F.), which was in January, 1847. From October to April are the hot months, and from May to September the winter ones. These are practically the only seasons, which may be called winter and summer. "Of the climate no evil can be spoken," is Mr. Child's final testimony.

FIELD AND FARM PRODUCTS.

Notwithstanding the adaptation of the most of Uruguay, with and without irrigation, to the usual farm products of a temperate climate and alluvial soil, there is little to record concerning cultivated crops except

that these, of all descriptions demanded in its markets, are raised in sufficient amounts for home needs, and as to wheat, an irregular surplus for exportation. Neither coffee, nor sugar, nor cotton, nor tobacco enter into the exportations, and they are not raised in appreciable quantities, or at all. A small amount of alfalfa, barley, and a few vegetables and fruits are produced beyond the needs of the population. Corn was exported in 1887 of the value of over $39,000, and wheat valued at $132,583.

Indeed, the people of Uruguay seem disposed, from the attention their statistics devote to the matter, to extend their production of wheat for export, since they sometimes produce more than they consume; and further, to extend the manufacture of flour for the same purpose. And it should be noted that of the countries of South America bordering upon the Atlantic Uruguay presents the best conditions for the successful growing of wheat, without doubt. Conditions are less favorable in Rio Grande do Sul, Brazil, and northward, as was shown in part in the article upon agriculture in Brazil, and that they are also less so to the south appears in the article upon the Argentine Republic. But notwithstanding soil and climate factors of favorable character, a country so little given to soil cultivation as Uruguay, of such small extent and number of inhabitants, and for three hundred and fifty years devoted to cattle-raising, the present principal occupation, and of increasing extent, is not likely to ever seriously influence the grain markets of the world. Its probable future importance in this respect may, however, be best considered in connection with that of that portion of the basin of the La Plata belonging to the Argentine Republic, of which it forms a part as to physical character and progress in development.

The departments of Canelones and Colonia are the present cereal producers, the latter to a small extent, and in its colonized parts, from which the yield is not reported in amount. The Statistical Annual for 1887 shows that Canelones produced in that year 2,156,252 bushels of wheat, or over 130,000 bushels less than Arkansas produced the same year on 231,357 acres. The yield was 10 bushels to 1 sown. The production of corn in the department was 537,834 bushels—25.3 to 1 planted—or something over a fifth more than was grown in Rhode Island, which has a smaller area, in the same year. During the five years ending in 1887 the average annual value of flour exported from Uruguay, less importation, was $337,708, and of wheat $35,734; total, $373,472.

During the same time the annual average number of bushels of wheat, of 60 pounds to the bushel, presented for market at Montevideo was 1,175,755. The figures for the series of five years show an average increased production of over 91,000 bushels per year, with variations of from 366,000 to 550,000 bushels from the average annual crop each way, indicating, what is not well known relative to the wheat region

on the Atlantic side of South America, great fluctuation of production. In the year ending June 30, 1889, Uruguay imported from the United States 198,259 bushels of wheat and 22,119 barrels of flour, worth together $277,500, and in 1890 731,636 bushels of wheat and 10,809 barrels of flour, worth $701,734. The value of the importations for the last-named year was nearly double that of the annual average exports of wheat and flour from Uruguay during the five years ending with 1887, before detailed. The deficiency which required the imports of 1889 and 1890 was caused by excessive rains during the wheat seasons, as reported by the United States consul.

THE CATTLE INDUSTRY.

"The chief industry of Uruguay is cattle-raising. * * * For cattle-raising it is the finest country in South America," says Child in stating the results of his personal observations, and confirming the views of others. Uruguay is so situated relative to facilities of shipment of range products to foreign markets, also, as to be the most favored, and therefore secures the largest net profit from its stock.

The Statistical Annual for 1887 and the official tax returns for 1883 give the total numbers of the different kinds of stock for those years as follows:

Kinds of stock.	Number, 1883.	Number, 1887.
Horned cattle	6,909,791	6,134,565
Sheep	14,595,495	15,104,428
Horses	512,228	429,790
Mules	8,327	6,949
Goats	6,146	16,837
Swine	(*)	17,127
Total	22,031,987	21,709,696

* Not stated.

The valuation of this stock in the official returns is very low, according to ideas of value ruling where markets are better, and are given by Mr. John E. Bacon, chargé d'affaires of the United States at Montevideo in 1886,† as follows:

Oxen	$10.00	Mules	$6.00
Cows	5.00	Mules, broken in	12.00
Horses	8.00	Sheep	.60
Mares	1.00	Goats	.60
Swine	5.00		

It should be stated, relative to the price of mares, that these animals are never used in Spanish America for any ordinary purposes, but only on the estancias for purposes of breeding, so that aside from the latter they are practically valueless, unless for food.

Relative to the pastoral industry, and giving it importance in Uruguay and some other portions of South America, is the related one of the

† Consular Reports, No. 73.

saladeros,* where animals are killed and variously fitted for market. The principal of these establishments in Uruguay are a Montevideo, and at Frey Bentos, Paysandú, and Salto, on the Uruguay River. At Frey Bentos Liebig's extract of beef is made, where 1,000 cattle per day are slaughtered through the summer. At the others the meat is cut into strips and salted and dried in the sun, forming the *charqui* or *tasajo*, which is exported in bags to Brazil, Cuba, etc. As the demand for this kind of meat is decreasing, efforts are being made for an organized exportation of live cattle and refrigerated meat to European markets. At present Mr. Child estimates the slaughter of cattle in Uruguay to amount to over 700,000 per year, one-half at the saladeros of Montevideo. The number of the meat animals introduced from the interior into that city in 1887, as officially stated, and the disposition made of them may be tabulated as follows:

Kinds of stock.	Arrived.	Consumed.	For the saladeros.	Exported.	For the interior.
Cattle	290,017	111,974	173,892	.....	4,151
Sheep	66,414	55,318	.....	11,096	.....
Goats	11,355	11,355	.....	.....	.....
Swine	5,540	5,540	.....	.....	.....
Horses	18,783	.....	[1]18,783	.....	.....
Mules	838	.....	.....	838	.....

[1] As this statement is from an official annual, it may be taken as a Government statement of the exports of horse flesh for food, the saladero products being for export.

This statement so far, however, does not show the total amount of meat products for home consumption or for export either through the saladeros or on the hoof. The most recent statement in this respect is that of Mr. Bacon for 1883, in the consular report before cited, and is as follows:

Horned cattle (home meat supply), in which is included the beef furnished to naval squadrons	number	502,000
Live cattle exported per annum	do	102,000
Killed in saladeros (slaughterhouses) per annum	do	704,000
Total	do	1,308,000

This is supposed to represent the largest portion of the increase of the herds and flocks of Uruguay. The forms which the exports derived from this source assume, and the amounts under each head, are given as follows for the same year:

Jerked beef or dried meat (charqui)	pounds	76,706,770
Pressed meat	do	3,326,751
Extract of meat	do	1,099,630
Grease	do	37,601,739
Tallow skins	do	11,547,590
Artificial guano (refuse)	do	9,000,000
Hair	do	3,250,102
Total weight	do	142,532,582
Cowhides	number	1,638,730
Sheep, living	do	142,000

* Literally, salting places.

The authority last cited states that from 600,000 to 700,000 cattle are slaughtered annually at the saladeros, "besides a vast number of sheep, and from 50,000 to 80,000 mares." He also gives the value of the component parts of a young ox at the saladeros, which is here given as stated, except the resulting sums, which are herein corrected and exceed his estimate of total value, viz:

Meat, 150 pounds, at 55 reals* per 100 pounds	$9.90
Hides, 68 pounds, at 71 reals per 75 pounds	7.74
Tallow, 40 pounds, at 13 reals per 25 pounds	2.49
Remnants	.50
Total value	20.63

The saladero expenses for each animal are stated at $3.60.

RURAL INDUSTRIES GENERALLY.

Of the 72,170 square miles in Uruguay, it was officially ascertained in 1884 that 1,507,277 acres only were devoted to farming, 38,750,406 to grazing, and the remaining 5,930,880 were waste or unclassified. Since that date, however, agriculture has made considerable progress, especially through colonists, and agricultural machinery from the United States has been freely introduced. Nearly all the lands are held by private owners, and the State, which encourages and assists immigration, has no land to bestow or sell. For taxation, agricultural land is valued at from $5 to $8 per cuadra, and grazing land at $10,000 to $14,000 per suerte.†

The soil is generally very fertile, and wheat, barley, oats, vegetables, and fruit are grown with little labor. In two or three departments tobacco has been successfully tried. The corn now cultivated is inferior in quality, but it does not appear that this is necessarily so. The grasses of the pastoral lands are perennial, succulent, and abundant, and, in connection with the mild climate and well-distributed water-supply, are a great encouragement to stock-raising. The amount of wool furnished by Uruguay to France, Great Britain, and the United States was valued at $5,861,164 for 1889; but Germany is a considerable importer, and Belgium perhaps the greatest, and the value of the actual clip of that year, as stated in Bulletin No. 6 of the Bureau of American Republics—viz, 9,150,000 pesos, equivalent to $9,472,080 in United States money—is probably nearly correct. On the basis of the number of sheep of 1887, the yield per head was about 63 cents in value. The value of the clip of 1886 was approximately stated by Chargé d'Affairés Bacon at $10,000,000.

The clip consists wholly of fine clothing wool, noted for softness, lightness, and strength. It is sent to market in bags of about 250 pounds,

* Value of the real, 12 cents.

† A cuadra, or square, contains about 2 acres, and a suerte 2,700 cuadras.

and baled for export in bales of about 1,000 pounds. The customs valuation upon which duty is based is $17 per 100 kilograms (about 220 pounds, at $7.73 per hundred), and 6 per cent is collected upon this valuation as export duty. The distribution of the clip of 1886 was as follows:*

Destination.	Bales.	Destination.	Bales.
Belgium	31,140	Italy	818
France	13,350	Portugal	968
United States	13,404	England	715
Germany	3,367	Spain	102
		Total	63,864

FOREIGN COMMERCE.

Considering the small extent and number of its population and area, respectively, the foreign trade of Uruguay appears large; but it should be remembered that much of the trade of the Brazilian province of Rio Grande do Sul and some of that of Paraguay is represented in the import and export figures of that nation. The respective branches of its trade and the total for three recent years are shown as to value in the following statement, based upon the Statistical Annual, viz:

	1888.	1889.	1890.
Inports	$30,515,054	$38,120,663	$33,498,608
Exports	28,994,144	26,867,691	30,109,327
Total	59,509,198	64,988,354	63,607,935

The details of the trade for 1890 are not at hand, but the following table for 1889 shows the imports, exports, and total value by countries, and is derived from the same source as the preceding, viz:

Countries.	Imports. from.	Exports.	Total trade.
Great Britain	$10,840,574	$3,677,030	$14,517,604
France	5,710,163	5,407,884	11,118,047
Brazil	2,593,176	3,410,984	6,004,160
Belgium	1,683,235	4,255,707	5,938,942
United States	3,532,102	1,491,723	5,023,825
Germany	3,552,806	1,345,760	4,898,566
Argentine Republic	1,501,040	2,370,608	3,871,648
Italy	3,375,787	395,446	3,771,233
Spain	2,707,048	379,918	3,086,966
All other countries	2,624,232	4,132,518	6,756,750
Total	38,120,163	26,867,578	64,987,741

While the foregoing table shows the volume and distribution of the foreign trade of Uruguay according to the official statement of that country, it disagrees with the official statement of this Government

* Vice-Consul Howard, of Montevideo, in Consular Report No. 73.

considerably for the year named, probably because that country reckons by the calendar and this by the fiscal year. The differences make the imports from this country larger, by the returns of Uruguay, by $1,504,719, and the exports to this country smaller by $1,495,241, varying the volume by only $9,478, but attributing a more favorable character to it, so far as this country is concerned, than it seems actually to possess. The following tables show our trade with Uruguay from the United States Treasury returns for the years named:

Imports from the United States.

Articles.	1886.	1888.	1890.
Wood, and manufactures of	$302,163	$412,754	$833,652
Breadstuffs	2,756	2,033	705,463
Mineral oils, refined	189,886	241,276	385,627
Iron and steel manufactures	85,110	143,898	294,712
Agricultural implements	51,652	66,788	230,280
Cotton manufactures	77,968	112,932	157,585
Chemicals, drugs, etc	20,833	40,832	42,835
Meat and dairy products	54,227	42,900	61,904
All other articles	325,950	274,017	498,054
Total	1,110,545	1,337,430	3,210,112

Exports to the United States.

Hides and skins, not fur	$3,094,945	$2,116,142	$1,472,993
Wool, unmanufactured	1,336,870	385,703	30,034
Hair, unmanufactured	209,629	91,655	118,825
All other articles	284,404	118,021	93,051
Total	4,925,848	2,711,521	1,754,903
Total trade	6,036,393	4,048,951	4,965,015

These tables show, among other facts, that the importation of farm products into Uruguay from the United States, during the five years considered, increased from $56,983 to $767,367 in value, and that its exports of pastoral products to this country decreased $3,019,592. In the meantime the volume of trade between the two countries has diminished over $1,000,000, while with France, Belgium, Germany, Italy, and Spain the trade of Uruguay is increasing slowly. From most European countries there are lines of steamers to the ports of Uruguay and the Argentine Republic, and also many sailing vessels, affording abundant shipping facilities, but the flag of the United States is most conspicuous by its absence from South American waters.

IMPORT AND EXPORT DUTIES.

Tables showing the existing import duties upon specified agricultural products introduced into Uruguay were published in the monthly report of this Bureau for September, 1890. Export duties upon certain animal products of that country were reported by Consul Hill, in October,

1890, to be as follows, reduced to pounds and to United States values as near as possible:

Articles.	Duty.	Articles.	Duty.
Wool.. ..... per 100 pounds..	$0.572	Oxhides salted.....each..	$0.241
Sheepskins.....do....	.360	Oxhides, dried.....do....	.117
Hair.....do....	.777	Horsehides, salted..... do....	.117
Grease, tallow, etc.....do....	.219	Horsehides, dried ..... do ...	.058
Jerked beef .....do....	.176	Calfskins .....per 100 pounds..	.439
Preserved meats, tongues .....do....	.439	Sealskins ..... each..	.154
Hoofs ..... do....	.109	Horns.....per 1,000..	2.412
Ashes, bones..... per 1,000 pounds..	.263	Meat extract .....per pound..	.044
Animal manure .....do....	.263		

CONCLUSION.

Uruguay is not alone interesting in itself as a rapidly developing agricultural country, but because it is representative of a much greater area, a large portion of which is less developed, in the Argentine Republic, including parts of the provinces of Entre Rios, Corrientes, and Santa Fé, and the territories of Misiones and Gran Chaco, and a portion Paraguay, of identical or similar character in many of their topographical, hydrographical, climatic, and soil features. The total of this area, including Uruguay, is over 500,000 square miles, and of this approximately two-thirds, or 300,000 square miles, is of similar physical characteristics; but this is a smaller area by 44,000 square miles than that of Texas and the Indian Territory together, a region which may be compared with the South American one in many respects without losing in the comparison.

VENEZUELA.

The Republic of Venezuela includes the northeastern portion of South America and a few adjacent islands, between latitudes 1° 8′ and 12° 16′ north, and longitudes 53° 15′ and 73° 17′ west from Greenwich, and has an area stated in its latest statistical publication at 591,000 square miles; in The Statesman's Year Book at 632,695; in the American Almanac at 439,119, and in the report of the International American Conference relative to an international railway line, at 394,374 square miles.* Adopting the Venezuelan authority, 282,000 square miles of the area are contained in the federal district and eight States, the remainder being divided into eight Territories. The boundaries are made by the Caribbean Sea and the Atlantic on the north, British Guiana on the east, Brazil and territories claimed by Ecuador, Colombia, and Peru on the south, and by Colombia on the west. It is larger in extent than Texas, New Mexico, Arizona, and Colorado combined. In 1889 the population was estimated to be 2,234,385, of which 326,000 were Indians, 86,000 uncivilized. In this population the female excess was 64,200, and there were 35,000 foreigners, consisting of Spaniards, Colombians, English, Italians, Dutch, French, and Germans, proportioned in the order named, with scarcely a representative of the United States. All except 98,385 of the population dwelt in the States and federal district, making for their area nearly 7.6 inhabitants to the square mile, or one-half of 1 per cent more to the square mile than the State of New York had in 1790.

Area and population by States, etc.

States, Territories, settlements, etc.	Square miles.	Population.	States, Territories, settlements, etc.	Square miles.	Population.
The Federal district	45	70,466	Territories:		
States:			Alto Orinico	119,780	38,850
Bermudez	32,243	287,979	Amazonas	90,928	
Bolivar	88,701	58,560	Armisticio	[1]7,046	
Carabobo	2,984	170,948	Caura	[1]22,564	
Falcon	36,212	200,898	Coajira	3,608	36,551
Guzman Blanco	72,499	517,508	Colon	166	43
Lara	9,296	254,431	Delta	[1]25,347	
Los Andes	14,719	327,798	Yuruari	81,123	20,510
Zamora	25,212	247,502	Settlements:		
			Bolivar	8	830
			Guzman Blanco	214	1,511
			Total	632,695	2,234,385

[1]Population reckoned with that of adjoining States.

It ought to be noted perhaps that the British authority known as The Statesman's Year Book, for 1885, gives the area of British Guiana,

*Diminished recently, however, by award on arbitration in favor of Colombia, to an unknown but not great extent.

bounding Venezuela on the east, as 76,000, and that the same annual for 1886 gives the area as 109,000 square miles; an increase during a year of 33,000 square miles to European possessions in America, and an equal loss to the Republic of Venezuela, so far unaccounted for by treaty or recognized conquest, and claimed by the latter country to be against her hitherto unbroken and undisputed right of possession acknowledged in the treaty of Munster, 1648, the definitive treaty of Aranjuez, 1791, and the treaty of London, 1814, which conferred what is now British Guiana upon Great Britian with the Essequibo as its permanent western boundary.

DISCOVERY BY COLUMBUS.

Venezuela was the first portion of the main land of the New World discovered by Columbus, near the mouths of the Orinoco, and during his second voyage. Alonzo de Ojeda, who accompanied him upon his first two adventures, made an independent voyage in 1502, using copies of Columbus's maps, and coasting farther west discovered and entered Lake Maracaibo. Americo Vespucio accompanied Ojeda on this voyage, and being an Italian, the Indian villages, which the discoverers found built upon piles in the lake, suggested the name of Little Venice for the region—in Italian, Venecia, and in Spanish, Venezuela, which was ultimately extended to the entire captain-generalcy and retained by the Republic.

FIRST CITY BUILT BY EUROPEANS.

In 1527 Spaniards, under the lead of Juan Ampuis and inspiration of Bartolomé de Las Casas, took possession of the coast at what is now Coro, in Venezuela, then called by its Indian name of Coquibacoa, erected a cross, which is still preserved, and founded finally the city which was for fifty years the capital of the country, and is still a State capital. This is probably the oldest city built by Europeans on the main land of the New World, and with its brass-bound cross, preserved under a canopy of masonry in the public square, and the remains of its church and Carmelite monastery built in 1540, is historically interesting. But as a capital or other rich city situated upon a narrow, low peninsula, or otherwise easily accessible from the sea, was not in early American historic times secure from the Morgans, Drakes, Knowleses, and independent gentlemen of enterprise who profitably amused themselves upon southern seas and along their shores, the Venezuelan capital was changed to Caracas, which lies 9 miles inland in a straight line, behind coast mountains about 8,000 feet high, and was for over two centuries inaccessible to artillery or a carriage from any near point upon the sea.

INDEPENDENCE OF SPAIN.

Venezuela, with Colombia, Peru, Bolivia, and Ecuador, was liberated from the rule of Spain by Simon Bolívar and his compatriots in a war during years of which no prisoners were spared, according to a practice

initiated by the royalists, a declaration of independence having been adopted by a congress of delegates of the captain-generalcies named on the 5th day of July, 1811, at Caracas, and a union formed for the struggle against Spain. The war practically ended in Venezuela with her decisive victory at Carabobo on the 25th of June, 1821, but was continued longer in Colombia, Peru, and Bolivia, to each of which Bolívar lent his efficient aid. In 1830 Venezuela withdrew from the successful coalition and has since remained independent. The 5th of July is annually celebrated in its principal cities by the officials, municipal bodies, and patriotic citizens, in assemblages before which addresses are made, and by processions to the churches and religious services therein. In these services the names of Bolívar "the Liberator" and Washington receive united honors.

CHARACTER AND FORM OF GOVERNMENT.

The form of government was originally modeled upon that of the United States, and is still similar thereto in leading points. The legislative power is vested in the Senate and House of Deputies, which consist, respectively, of three senators from each State, and one deputy for each 35,000 inhabitants or fraction exceeding 15,000, forming a Congress of twenty-four senators and fifty-two deputies, all of whom are elected for four years.

The Congress elects from its body one senator and one deputy from each state, and one delegate from the federal district, who compose for two years a federal council, and this council elects from its own number the President of the Republic, who, like its members, is ineligible to a continuous reëlection. The President exercises his powers with the concurring vote of the council, and can suspend the operation of a law, but not veto one without the approval of the States. Thus, with the approval of the council, the Executive may exercise in various ways extraordinary powers, even to the extent of organizing an army in time of peace, suspending guarantees, removing all public officers, or expelling individuals. Under such conditions the constitutional provisions for popular but open suffrage, free speech, a free press, security of person and property, etc., seem sometimes to fail in efficacy, though less frequently of late than in former years. The judicial officers are elected by Congress for terms of eight years.

NATURAL CHARACTER AND PRODUCTIONS.

The country is naturally divided into three zones, characterized by their principal productions. The first, embracing about 134,000 square miles, equal to Missouri and the Indian Territory in extent, is mainly agricultural, and contains the plantations producing coffee, cacao, sugar cane, cotton, cereals, and fruits, and also sustaining many cattle. The second, of about 153,600 square miles, nearly the extent of California, is the interior grazing region and sustains large herds of cattle,

horses, and mules. It consists of high table-lands and extensive plains which are partly inundated during the rainy season, and is generally rich in pasturage and in portions suited to agriculture. The third is the great forest region, principally from the Orinoco to the Brazilian boundary, and contains an abundance of the most valuable timber, natural plantations producing rubber gum, copaiba, vanilla, tonka beans, considerable cinchona, and abundance of dye woods, barks and legumes for tanning, and an immense variety of orchidaceous plants. This zone is also rich in gold and other minerals, and contains the now famous Yuriari mining region, and other equally rich mines far up affluents of the Orinoco, which though located are undeveloped because of scarcity of labor and cost of machinery upon the ground.

CLIMATE AND HEALTH.

Although so near the equator, the country has a great variety of climate, on account of its mountain elevations, consisting in the Andean, Coast, and Parima ranges, and the modifications caused by its extensive woodlands, even in the cultivated regions, and its abundant water courses, numbering over 1,000 rivers, with the Lake of Valencia, covering 66 square miles, and Lake Maracaibo 6,000. There are but two closely marked seasons of the year, viz, the dry, which begins in October and ends with March, with little rain, north or northeast winds, and agreeable temperature, and the rainy, which begins in April and ends in October, with abundant rains, east to southeast winds, and higher temperature. Temperature is modified by elevation to an extent indicated generally by the first following statement, and as to specified places and elevations in the second; and in the latter, for convenience of information, the population of the places is added.

Temperature at given elevations.

	°F.
From sea level to 1,900 feet	77 to 86
From 1,900 to 6,500 feet	60 to 77
From 6,500 to 9,000 feet	36 to 60

At 15,000 feet, perpetual snow.

Temperature, elevation, etc., of given places.

Cities.	Average temperature.	Height above sea.	Population.
	°F.		
Caracas	71.20	3,025	71,000
Carupano	80.60	26	11,000
Ciudad Bolivar	82.81	187	11,000
Barcelona	81.41	43	12,000
Barquesimeto	77.90	1,711	29,000
La Guayra	80.60	26	15,000
La Victoria	73.90	1,496	7,000
Maracaibo	80.60	30	34,000
Maturín	81.50	23	12,000
Merida	61.05	5,308	11,000
Montalban	72.05	236	7,114
Nirgua	71.00	2,503	2,000
Puerto Cabello	80.06	6½	17,000
Rio Caribe	84.20	16	6,000
Valencia	78.80	1,824	38,000

Venezuela is in general a healthy country, precaution suggested by experience, there as elsewhere, being fairly observed. Although the heat is very strong under the midday sun, sunstroke is rare; but exposure may facilitate or induce fever. The prevalent custom is to rest, usually to sleep, each day for a time between 11 and 1 o'clock, to retire and arise early, and to do all things moderately. Bathing is frequent, clothing light and fitting loosely, and exposure to rain and dew, or to the full moon, is avoided. Strong drinks, when used at all, are sparingly and slowly taken, much diluted, in the evening at home, with callers or socially at the club, and pure wines are used at the principal meals by the better class. Drunkenness and its logical train of miseries are rare. Early breakfast, at 7, consists of usually one cup of strong, clear, excellent coffee, or of chocolate, and dry bread, with perhaps butter or a little cheese; the full breakfast at 11 is a hearty meal, with fruits and meat or fish, and with many is the principal one of the day, while dinner, at 5 or 6, is not much different, except that fruits are not served, Spanish-Americans observing the saying well that in the morning fruit is gold, in the evening silver, and at night lead. If the usual bedtime is delayed, a little cake and wine or cordial, with coffee or tea, are served, especially with company present. Everything is done with regularity, without hurry, and, affecting home life, with cheerful sociability. Regular climate conditions which, though somewhat oppressive, are thus regularly recognized in manner of living, are favorable to a minimum of disease, and it is not singular that the ordinary death rate in tropical Venezuela is comparatively small, being from 2 to 4 per cent in such States as Zulia and Guzman Blanco, which include the most populous cities, while the average for the United States by the last completed census was nearly 2 per cent. The census of 1881 in Venezuela disclosed one person in 10,486 as from 100 to 125 years old, while the proportion with us in the census of 1880 was one in 12,489.

PRINCIPAL PRODUCTIONS.

Coffee stands first among the productions of Venezuela which have a recognized commercial importance, and with the advance in prices maintained for some years past plantations have been greatly extended. The excellence of the Venezuelan coffee, and that grown in the eastern part of Colombia adjacent, which is marketed in Maracaybo and passes as a product of the former country, is well known, and strengthens the demand. In fact, as no cargo of Jarva coffee is recorded as having been imported into the United States during the last twenty years, unless recently, nor any of Mocha for a much longer period, and as coffees formerly sold at retail under the names of "Maracaibo" and "La Guayra" have in name disappeared from the stores, there is an inference warranted that the coffees still abundantly served to families under the names of "Mocha" and "Old Government Java" are iden-

tical with those shipped from the Venezuelan ports of La Guayra, Puerto Cabello (this coffee is all labeled La Guayra), Maracaybo, and in less quantity from Ciudad Bolivar. The total value of the coffee exported in 1888, including that from Colombia which passed through Maracaybo, was $12,083,480. The possible importance of Venezuela in the future development of coffee production may be approximately estimated from the fact that in some States the proportion of land planted to coffee to that which is well fitted for such use but now idle is only as 1 to 250, which is as much as to say that the value of the production of 1888 at the prices of that year may be increased in future enormously, the figures reaching billions annually. The average value of the coffee at the point of export which was shipped to the United States from Venezuela in 1888 was about 14½ cents per pound.

Mineral productions rank second in importance, but less in export value apparently since 1885, as the gold of the Yuruari region passes out more through the British ports. The export through Ciudad Bolivar from those mines, from 1866 to 1886, was $33,921,955. Since the latter date the value is difficult to ascertain. The rich copper mines of Aroa, worked by an English company, furnished from 1880 to 1888 249 cargoes of minerals and pure metals, valued at $4,712,600. The value of all mineral exports in 1887 was $5,712,100. What the value of the annual production is, exported and unexported, is not easy to ascertain. It is, however, far less than it will be in many future years, as the country is rich in gold, silver, copper, and iron, and possibly so in sulphur, coal, coal oil, asphalt, lead, kaolin, etc. The salt mines under government control produced a revenue in 1888 of $182,000.

The third article of commercial importance is cacao, which yields the producer a greater proportional profit, and the value of the exports of which amounted to $2,297,350 in 1888. There is plenty of suitable land upon which to increase the amount of this production also, the principal hindrance being, as in other cases, the scarcity of reliable laborers. The cacao of Venezuela is of superior quality, and the area of plantations was considerably increased about 1880, during the depression in coffee prices, upon the area of the coffee plantations.

Next in present importance are the herds of cattle and flocks of goats, which furnish, besides meat, milk, and cheese to the population, hides and skins for export, and cattle for some of the beef markets of some of the West Indian Islands. The beef is always of inferior quality, as the grass it is fed upon is coarse, and there is no grain-feeding. The cattle which arrive at or are produced near the coast for home meat market or for export would not be considered as in good working condition in the United States, and their meat is so tough that a beefsteak is fortunately unknown. It is divided for sale into chunks with a common axe, and so as to give to each customer impartially his share of the bones. The value of the cattle and asses exported in 1888 was $330,400.

Coro, or the State of Falcon, of which it is the capital, furnishes the largest number of goatskins for export, which, as they are shipped through the Dutch port of Curaçao, have acquired from their well-known and illy-pronounced name the title of "Curaçao kid" and goat. The island of Curaçao does not produce a hundred bales of goatskins per year. The value of the hides and skins shipped from Venezuela in 1888 was $899,865, making, with the value of stock exported, $1,230,265. The latest statistics of live stock are for 1886, as follows:

Classes.	Number.	Classes.	Number.
Horned cattle	5,275,481	Swine	1,439,185
Goats and sheep	4,645,858		
Horses and mules	622,306	Total	12,752,750
Asses	769,920		

All the domestic animals of Venezuela, and generally of the tropics, which are unimproved, are of small or medium size, but active and hardy. Venezuela has comparatively few sheep, and finds a better and easier profit in goats.

There are hundreds of other productions of this rich country which are of domestic and commercial value, but which need not enter into particular consideration until they become of general or special importance. Fruits of all tropical kinds are sufficiently abundant, and production can be infinitely multiplied, but there is at present no foreign market. The forests are rich in woods valuable for household furniture and other purposes, but labor is lacking to make even the best of them available. Not much grain is produced, nor will there ever be under prevalent conditions of climate, labor, and easy existence upon spontaneous productions. Corn grows and yields good crops when fairly attended to and free from the ravages of locusts; but it is safe to assume that, as regularity of farm labor can not be commanded, and as locusts are liable to pass in any year and leave no leafy vestige, even the highest palm trees being made clean skeletons, corn will not very soon be cultivated to any extent; not usually enough to yield green corn for the city markets.

TRADE WITH THE UNITED STATES.

It will be seen from the foregoing that the United States purchases from Venezuela nearly as much as all other countries combined, while Venezuela purchases of us only a little more than 25 per cent of her importations, but buys considerably more than twice as much from three European countries as from us.

Character and value of imports from Venezuela into the United States during the year ending June 30, 1889.

Articles free of duty.	Value.	Articles paying duty.	Value.
Animals	$70	Books, maps, etc	$1,559
Cacao or cocoa	138,753	Carpet wool	233
Cinchona	3,099	Copper ore	54
Cocoanuts	6,291	Copper bars	35
Coffee (63,114,529 pounds)	9,138,591	Drugs and dyes	334
Cotton	10,135	Fish	2
Drugs and dyes	72,343	Fruits, preserved	24
Dyewoods	18,252	Furniture	7
Furs and skins	87	Hats	30
Goat skins	330,969	Lead, manufactures of	187
Guano	71,690	Metal, manufactures of	25
Hides	530,913	Musical instruments	208
Household goods	50	Oranges	31
Resins and gums	483	Sheep	25
Rubber, crude	38,157	Spirits	12
Seeds	371	Zinc, spelter, etc	4,009
Spirits, distilled	1,211		
Vegetable ivory	120	Total dutiable	6,800
Woods	5,637	Add free articles	10,385,769
All other articles	18,547		
		Total imports	10,392,569
Total free of duty	10,385,769		

The imports of 1889, paying duties at the average rate of 45.13 per cent ad valorem on dutiable articles, would augment our treasury account $1,809.26. Had the total importations paid duty at the now average rate of 29.50 per cent on all articles, free and dutiable, our treasury receipts would have been $3,045,807.85. We therefore remitted, on Venezuelan exports to this country for the year, $3,043,998.59.

Classes and value of exports of domestic products from the United States to Venezuela during the year ending June 30, 1889.

Articles.	Value.	Articles.	Value.
Breadstuffs:		Provisions, as meats, etc.:	
Corn	$118,724	Bacon and ham	$70,393
Wheat flour	791,007	Butter	109,440
All other	79,858	Lard	477,036
Chemicals, drugs, dyes, etc	137,265	All other	17,162
Cotton, manufactures of	467,141	Tobacco and manufactures of	87,825
Iron and steel, manufactures of	442,450	Wood, manufactures of	91,351
Oils, mineral, refined	121,849	Other merchandise	690,104
		Total exports	3,701,605

IMPORT DUTIES.

The following are the rates of import duty upon agricultural articles, as last reported to the Department of State, and of such duty with the addition of another which must be paid before goods are permitted to leave the ports of entry for the interior, such additional tax being 12½

per cent of the amount of the import duty, and constituting a neat reversal of the octroi system of some other countries:

Articles.	Import duties proper (in bolivars.)	Total impost, including surtax of 12½ per cent (in bolivars.)
	Per kilo.	*Per kilo.*
Live animals (except leeches)	Free.	Free.
Eggs	Free.	Free.
Wheat	0.10	0.11¼
Rye	.10	.11¼
Barley, in the grain	.10	.11¼
Oats	.10	.11¼
Maize	.10	.11¼
Rice, in the husk	.10	.11¼
Barley meal and all meal not otherwise mentioned	.10	.11¼
Bran	.10	.11¼
Hay	.10	.11¼
Apples, grapes, pears, and any other fresh fruits	.10	.11¼
Pressed grapes	.10	.11¼
Wheat flour	.25	.28⅛
Beans, pease, lentils, haricots, kidney beans, potatoes, and all vegetables and garden produce	.25	.28⅛
Malt	.25	.28⅛
Beef, jerked salted, in brine, or smoked, smoked or salted bacon or tongues, not otherwise mentioned	.25	.28⅛
Hams and bacon not imported in tins	.25	.28⅛
Lard and butter	.25	.28⅛
Oil, table or salad	.25	.28⅛
Wines of every kind, in pipes and barrels	.25	.28⅛
Wines imported in demijohns and bottles, excepting Spanish and Bordeaux red wines	.75	.84⅜
Olives and capers	.75	.84⅜
Barley, bruised or ground	.75	.84⅜
Hops	.75	.84⅜
Potato, maize, and rye flour	.75	.84⅜
Sausages, jams in tins, preserved foods, etc	.75	.84⅜
Suet, raw, undressed, or pressed, etc	.75	.84⅜
Cheeses	.75	.84⅜
Condensed milk	.75	.84⅜
Fruit in brandy or sirup and dried fruits	.75	.84⅜
Raw wool	.75	.84⅜
Hides not tanned or prepared	.75	.84⅜
Oil, almond or linseed	.75	.84⅜
Tobacco in the leaf	5.00	5.62½

[The bolivar is nominally of the value of 20 cents, but now is really worth but 13.8 cents, U. S. currency.]

MEANS OF COMMUNICATION.

Excepting the Orinoco and Lake Maracaibo the water courses are as yet little used, as those navigable for vessels are mostly away from centers of population. There are comparatively few carriage roads, and many mule paths. Previous to 1882 there was but one railroad, built for the convenience of a private enterprise in copper mining. Since that date much progress has been made in railway building, so that now the communications completed and under way are as follows:

Miles operated.—From La Guaira to Caracas, 23.75; Tucacas to Aroa, 56.25; La Ceiba to Sabana Mendoza, 25.31; Caracas to El Valle, 3.43; Maiquetia to Macuto, 4.38; Carenero to Rio Chico, 20; Caracas to Petare, 6.25; Caracas to Antimano, 5.63; Puerto Cabello to Valencia, 34; total length, 179.

Lines of railway in construction.—From Petare to Santa Lucia, 28

miles; Santa Cruz to La Fria, 56.25; Orinoco to Yuriari, 143; Barcelona to the Coal Mines, 12; total length, 239.25 miles.

Lines of railway contracted for.—From Puerto Cabello to the Apure River, 125 miles; La Luz to Barquisimeto, 50; Rio Escalente to Merida, 106; total length, 281 miles.

It thus appears that the total length of railways provided for, so far, in Venezuela is 699¼ miles, a considerable undertaking considering the sparseness of population and the difficulty of construction over some portions of the lines, as from La Guaira to Caracas, where the line extends nearly 24 miles between two points but 9 miles apart in a straight line. Several of the short lines, separately constructed, are connecting roads, as those from Macuto to Maiquetia, La Guaira to Caracas, and thence to El Valle, to Petare, and to Antimano. In fact, the constructed and projected roads will nearly or quite form two separate systems, portions of which would enter into an intercontinental chain and thus be of increased usefulness and decreased cost of operation. There is perhaps no country of its size in South America which would receive greater benefit than Venezuela from such an extended system, and none which would return more in proportion for such a benefit.

Foreign communication with the principal seaports is almost daily, and there were over 7,500 entries of vessels in 1888. Venezuela's marine numbers over 2,500 vessels of 25,317 tons burden, 26 of which are steamers of 2,523 tons, for sea and river navigation.

Generally speaking, the means of communication between haciendas and villages are by riding horses, mules, and donkeys, traversing the country by primitive paths; and from villages to cities by mule, ox-cart, and donkey trains over roads in some cases rude and in others well constructed and maintained; winding along the bend of fertile valleys and the sides of wooded mountains; now amid charming scenes of cultivation, and now in the open shade of coffee plantations, or the semiobscurity of natural forests festooned with vines and florid with abundant varieties of orchids, edged with other varieties growing from the soil, among which may be found several kinds of the begonia growing to a height of 6 feet. The largest amount of freighting is upon the backs of donkeys, and such must continue to be the case between the mountain dwellings and the villages and many of the cities, whatever advancement may be made in other respects. As to the postal service, except where railroad lines are now in operation, the mails from the seaboard to the remote interior are still carried by Indian runners, who, each with a package of about 15 pounds weight or less, with light and scanty clothing to put on near the villages, hidden for the purpose, but naked through the woods, swiftly pursue the shortest and most secluded paths inaccessible to common travel, with unsurpassed fidelity to trust, unfailing regularity, and endurance such as would make the fortune of a professional walker. The express messenger is in an unusual sense a common carrier, being usually an ordinary habitual donkey driver.

POSTAL AND TELEGRAPH STATISTICS.

There are 162 post-offices in the country, being 44 more than there were in the United States a hundred years ago, when its population was greater than Venezuela's now is. The packages by post delivered in 1886 numbered 2,911,400. The rate on letters runs from 5 cents to $1, and on printed matter and samples of goods it is 1 cent per 30 grams. Payment must be made by affixed stamps. In most places mail is delivered at least daily. The cost of the postal service, including that of the postal union, is $116,774 per year. There are 2,612 miles of telegraph line belonging to the Government, with 80 offices, 128 officers, 109 guards, and 86 persons employed in delivery. Rates, in usual hours, up to 10 words, exclusive of signature or address, 20 cents; excess up to 5 words, 5 cents; on holidays, from 6 p. m., and in foreign languages, double rates; from 10 p. m. to 7 a. m., quadruple rates; in cipher, triple rates. Messages sent in 1886, official, 68,066; private, 174,320; total, 242,386. Receipts for the year, $47,810.

PUBLIC SCHOOLS.

In 1870 education was made free and compulsory, and for many years schools have increased at the rate of over 100 per year, and attendants at the rate of over 6,000, until the former now number 2,000, for primary instruction, and the latter over 100,000. There are 4 normal schools and a school of art and trades. There are besides, for higher education, 2 universities, 20 federal colleges, 9 colleges for girls, 1 polytechnic school, schools for fine arts and for music, and 28 private colleges and a nautical school. There are 2,300 primary school teachers and 594 professors in the various high schools and colleges. There are still only schools enough for about half the children between the ages of five and fifteen years. The average annual cost of the schools per scholar is $8.

NATIONAL DEBT.

In 1880 the public debt, created principally of loans from Europe, and particularly from England, amounted to over $54,000,000, upon which there was failure to pay interest. Since that time, by compromises and refunding, the debt has been reduced so that in 1889 it only amounted to $22,517,427, upon which interest at 4 per cent was regularly paid. Considerable public improvements show the use which has been made of much of this money, while some has been consumed in revolutionary movements. Happily, through the increasing stability of public affairs, consequent prosperity, and favorable readjustment of the debt, it has lost its place as a matter of principal importance.

REVENUE AND EXPENDITURE.

The principal source of revenue to the Government is that of customs duties, which yield from $4,500,000 to over $5,000,000 per year, being in 1888, last reported, $5,945,763, to which the transit tax added the

next largest item of $1,386,310. The total revenue for the year was $8,144,906, and expenditure $8,650,990, leaving a deficit. Of the expenditure $1,867,666 was for public works, $857,502 for interest on the public debt, $811,530 for the Army, and $667,767 for public instruction. The revenue of the several States and the federal district for the same year was $1,601,885, and the expenditure $1,459,423, a considerable increase in both items over those of the preceding year.

UNEQUAL CONDITIONS.

Nearly one-half of all Venezuela sells for export is sold to the United States, and nearly all that amount comes in free of duty here. There is, however, a tax on exports from Venezuela, forbidden by its constitution, but effectually collected, of varying amount according to the determination of executive decrees. The amount of this levy upon foreign consumers is difficult to determine, as is the ad valorem rate of import tax, as it is made up of varying items; as wharfage tax, trucking charges, state tax, etc., which varies with the charges where the tax is levied, and is not published in official reports. It is safe to assume that it amounts to as much as the export tax on coffee in Brazil, which is 16 per cent ad valorem. At that rate the export tax on goods sent to the United States in 1889 would return to Venezuela an income of $592,593 on the export branch of her trade with us. On the import side the duties are much higher; but as there is a varying rate, running though eight classes, from nearly 9 cents to $176 per 100 pounds gross weight of goods, this also can only be approximately determined as to average rate of ad valorem duty. This average, taking the record of imports and of duties collected for a series of years, and a range from 29.6 to 54.8, appears to be a little more than 40 per cent. At the rate of 40 per cent our exports to Venezuela paid duties to her in 1889 amounting to $1,481,482; to which add her export tax on shipments to us, and it appears that there was a pecuniary gain in duties on the whole trade with the United States of $2,034,075. This amount added to that of the duties remitted on our imports from Venezuela, before mentioned, amounting to $3,043,998, would give a total of $5,078,073, or about two thirds the amount of annual expenditure of the Venezuelan Government. Reciprocity is unquestionably desirable, to place our trade with Venezuela upon an equitable basis.

GENERAL CONCLUSIONS.

The total area of South America, as shown by the aggregate of statements of areas expressed herein, and tabulated further on, is 7,359,223 square miles.* Of this area, which is half a million greater than that of North America,† the Statesman's Year Book estimates 4,228,000 square miles to be fertile, and 2,564,000 as steppe or plains land, of dubious fertility. The total area is more than twice that of all Europe, and its annual contributions to the wants of portions of the world different in climate become increasingly important according to the increase of population, wealth, and surplus production of the countries differing from it.

Area of South America by countries.

Countries.	Area.	Countries.	Area.
	Sq. miles.		*Sq. miles.*
Argentine Republic	1,125,086	Paraguay	74,296
Bolivia	526,141	Peru	463,747
Brazil	3,219,000	Uruguay	72,170
Chile	290,834	Venezuela	632,695
Colombia	504,773		
Ecuador	262,951	Total	7,359,223
Guianas	187,530		

On the other hand the productions of portions of the world having mainly a different climate are of less importance to South America, because nature makes continual provision for the satisfaction of the prime necessities of its people. Where an acre in bananas yields as much nutriment as would twenty in wheat,‡ and the former grow often without cultivation, wheat becomes almost a luxury, and common people neither

* The Statesman's Year Book for 1891 states in its introductory tables the total area of South America at 6,837,000 square miles; but the subsequent statements by countries therein foot up 7,472,937 square miles for all South America, more nearly agreeing with the figures herein preferred.

† Excluding Newfoundland, the area of which is undetermined.

‡ Humboldt's estimate.

cultivate it nor clamor for its importation. So where little clothing is required by the mass of the people, they become fastidious about that little. In these and similar cases markets have to be made and cultivated, as in South America, where resident branch houses in all kinds of import therefore gain and retain paying advantages, by learning and catering to the tastes and whims of most classes, and creating demand.

Still the trade of South America, import as well as, or even more than export, has augmented during the last fifteen years in a proportion more than double that of the increase of population. This indicates increased activities, increased wealth or spreading civilization and enlightenment, or all of these. The following table showing the population of all South America by the enumerations nearest to 1875 and 1890 respectively, shows an increase of only 6,865,998 in the fifteen years, which is about $1\frac{3}{4}$ per cent. per annum (1.69 per cent). The figures for the population as of 1875 are from the Year Book herein referred to, and those as of 1890 are from the several articles herein. The remarkable decrease of population in Paraguay and Peru during the period is considered in the proper places under those heads.

Statement showing the population of South America by countries, and its net increase in fifteen years.

Countries.	Population in 1875.	Population in 1890.	Increase.
Argentine Republic	1,736,922	4,066,492	2,329,750
Bolivia	1,742,352	2,333,340	590,988
Brazil	10,196,328	14,002,335	3,806,007
Chile	2,068,447	2,525,819	457,372
Colombia	2,916,703	3,878,600	961,897
Ecuador	1,300,000	1,004,651	[1]295,349
Guianas	268,133	344,019	75,886
Paraguay	1,337,439	239,774	[1]1,097,665
Peru	3,199,000	2,621,844	[1]577,156
Uruguay	450,000	614,257	164,257
Venezuela	1,784,194	2,234,385	450,191
Total	26,999,518	33,865,516	6,865,998

[1] Decrease. Total increase 25.43 per cent = 1.69 per year.

The following tabular statement of the trade of South America with foreign countries mainly, as of 1875 and 1890, is taken from the same sources as the preceding one, and shows an increase during the fifteen years of 52.38 per cent, or $257,191,398, being an average yearly increase of 3.48 per cent, or as before stated, more than twice that of the increase in population. In this the remarkable decrease in Peru alone is partly made up by the increase in Chili, which more than covers it in amount. The average annual increase is in percentage nearly that of the United States during the same period, taking our imports and domestic exports as the basis of calculation, and excluding coin, the per cent of the annual increase averaging for this country 3.88, or .40 more than for South America which is less than a half per cent more, while our per cent of annual increase in population was 2.4.

Statement showing the foreign trade of South America by countries and its net increase in fifteen years.

Countries.	Total trade in 1875.	Total trade in 1890.	Increase.
Argentine Republic	$106,087,000	$234,269,301	$128,182,301
Bolivia	10,439,750	14,599,500	4,159,750
Brazil	153,247,500	204,836,966	51,589,466
Chile	72,621,455	118,919,439	46,297,984
Colombia	28,000,000	34,489,286	6,489,286
Ecuador	2,939,433	5,171,056	2,231,623
Guianas	19,689,489	23,028,876	3,339,387
Paraguay	2,187,248	3,297,000	1,109,752
Peru	53,515,000	10,594,363	*42,920,637
Uruguay	31,560,000	63,607,935	32,047,935
Venezuela	10,703,000	35,387,551	24,684,551
Grand total	491,009,875	748,201,273	257,191,398

* Decrease.

But the following tabular statement and proper deductions therefrom show not alone the value of the present trade between South America and the United States, and its increase during the last fifteen years, but also that, whereas the per cent of increase of the foreign trade of South America with all countries averaged 3.48 per year during the fifteen years ending in 1890, in the like period ending June 30, 1891, in its trade with the United States the average annual per cent of increase was 4.63, or 1.15 per cent greater; which is equivalent to the statement, which the figures appear to warrant, that the increase of the trade of South America with this country during fifteen years has been one third greater in percentage than the increase of its trade with the whole world.

The figures used in compiling this table are from the Treasury reports on commerce for the respective years; but as a part of our trade with Dutch and French Guiana is not separately stated, $1,097,172 has been assumed as their share in it not separately stated.

Statement showing the trade of South America by countries with the United States and the net increase in fifteen years.

Countries.	1876.	1891.	Increase.
Argentine Republic	$5,121,926	$8,694,619	$3,572,693
Bolivia		10,114	10,114
Brazil	52,706,391	97,279,868	44,573,477
Chile	2,912,974	6,582,281	3,669,307
Colombia	9,444,088	7,874,343	*1,569,745
Ecuador		1,739,175	1,739,175
Guianas	4,619,743	7,815,680	3,195,937
Peru	2,617,895	1,782,725	*835,170
Uruguay	2,930,676	3,389,676	459,000
Venezuela	9,299,993	16,794,588	7,494,595
Total	89,653,686	151,963,069	62,309,383

* Decrease.

The following statement, occurring in the report of the State Department on "Commercial Relations of the United States for 1876" (see p. 7), of which work of the State Department the writer of the present

bulletin had charge, may properly be reproduced as marking a point from which industrial progress among the Republics of the new world has become perceptibly more international and sympathetic:

This country is a seemingly uninterested spectator of the continuous and slowly successful efforts of its near neighbors, whose destines are involved to a greater extent than are those of other portions of the world with her own, to emerge from traditional hindrances into a development which, for the interest of all, should be in sympathy with hers, and which may properly be influenced to a large extent through the peaceful operations of commerce.

And commerce is based on the productive industries, the greatest of which is agriculture.

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